MULTICODER™ MC-TRANS

User Guide V1.2

Teracue eyevis GmbH
Schlossstr. 18
85235 Odelzhausen
Germany

Tel: +49 (0)8134-555-10
Fax: +49 (0)8134-555-199

info@teracue.com
www.teracue.com

Document Version 1.2/130228

COPYRIGHT

This document may not be reproduced in any form, in whole or in part, without the prior permission of **Teracue eyevis GmbH**.
Copyright © 2014 by **Teracue eyevis GmbH**, all rights reserved.

DISCLAIMER

This publication supersedes all previous publications.

Information and specification in this documentation is subject to change without notice. Please make sure you have the latest document version. User guides are located at: www.teracue.com/support

If you find some points in this document unclear then please let us know, so we can improve this documentation.
Thank you! Mail to: documentation@teracue.com

All information within this document is confidential to **Teracue eyevis GmbH** costumers and should not be copied or distributed to non **Teracue eyevis GmbH** customers.

TRADEMARKS

MC-TRANS™ and all of its components are registered trademarks licensed to **Teracue eyevis GmbH**.

All other logos and trademarks both marked and not, may be trademarks or registered trademarks and therefore property of their respective owners.

I. Information about the manual

This document is designed to help users setup, configure and work with the MC-TRANS.

If you received this publication as a PDF, then it's a good idea to print it out for future reference.

It is best to use this user guide directly in front of your computer, by doing so you try out everything at once.

.!. Important features are marked by this sign.

II. Content

1. OVERVIEW 5

2. GENERAL INFORMATION 6

2.1 UNPACKING THE MC-TRANS 6
2.2 SETTING UP THE MC-TRANS AND SAFETY INSTRUCTIONS 6
2.3 FRONT PANEL OF MC-TRANS 7
2.3.1 Configuration Buttons 7
2.4 NETWORK INTERFACES 8

3. MC-TRANS USER GUIDE 8

3.1 ACCESSING AND CONFIGURING MC-TRANS 8
3.2 LOGIN 9
3.3 GRAPHICAL USER INTERFACE OF MC-TRANS 10
3.3.1 Navigational Menus 10
3.3.2 'APPLY' and 'SAVE' Buttons 11
3.3.3 Blue Info-Box 11
3.4 MC-TRANS CONFIGURATION 12
3.4.1 Menu: Encoder / Input 12
3.4.2 Menu: Encoder / Video 14
3.4.3 Menu: Encoder / Audio 16
3.4.4 Menu: Encoder / Inserter 17
3.4.5 Menu: Encoder / SAP 18
3.4.6 Menu: Encoder / Transport 19
3.4.7 Menu: Encoder / Destination 20
3.4.1 Menu: Encoder / Xplayer 22
3.4.2 Menu: Encoder / SDP 23
3.4.3 Menu: Encoder / HLS Streaming 24
3.4.4 Menu: Presets / Management 25
3.4.5 Menu: Presets / Save 26
3.4.6 Menu: Presets / Load 27
3.4.7 Menu: Network / Settings 28
3.4.8 Menu: System / Date/Time 29
3.4.9 Menu: System / User Management 30
3.4.10 Menu: System / Service Stop 31
3.4.11 Menu: System / Default Settings 32
3.4.12 Menu: System / Monitoring 33
3.4.13 Menu: System / Monitoring All 34
3.4.14 Menu: System / About 35
3.5 HELP 36
3.6 LOGOUT 37
3.7 MC-TRANS WEBSERVICES 38

4. VIDEO ENCODING GUIDELINES 39

4.1 MPEG-2 VIDEO GUIDELINES 39
4.2 H.264 GUIDELINES 40

5. AUDIO ENCODING GUIDELINES 42

5.1 MPEG-1 AND MPEG-2 AUDIO GUIDELINES 42

6. RESTRICTION OF HAZARDOUS SUBSTANCES DIRECTIVE (ROHS) 43

7. WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT DIRECTIVE (WEEE) 43

1. Overview

MultiCoder™ is the product family name of a variety of live stream encoder and transcoder engines which are introduces below:

MC-SCREEN:
MC-SCREEN encodes any local desktop- and screen-applications such as PowerPoint, Excel/Word, Websites including embedded video etc. MC-SCREEN supports HD-resolution for detailed reproduction of text, figures and fine details. It enables exclusive software encoding for usually installed PC's and laptops, without grabber card.

MC-VGA/DVI:
MC-VGA/DVI encodes external desktop- and screen-signals such as PowerPoint, Excel/Word Websites including embedded video etc. with VGA/DVI input. MC-VGA/DVI supports HD-resolution for detailed reproduction of text, figures and fine picture textures. It has a VGA/DVI grabber card.

MC-ENC:
Multiformat encoder and live stream transmitter with video and audio input. MC-ENC supports Composite (CVBS), Y/C, S-Video, SDI and Component (YUV) signals via different video grabber cards.

MC-TRANS:
MC-TRANS enables transcoding and transrating of existing IPTV live streams. Allows stream modification and on-the-fly conversion of stream parameters: such as MPEG format, bitrate, bitrate type (CBR/VBR), resolution, GOP structure and much more.

MC-ROUTE:
MC-ROUTE is an application for converting, routing and bridging different streaming types. It is designed for streaming to external locations, for WAN transmissions or for the adaptation and alignment of live streams within an IPTV system. Multiple live input streams can be modified to unicast, multicast or multiple unicast/multicast streams.

2. General Information

The following subchapters contain general information about the MC-TRANS.

2.1 Unpacking the MC-TRANS

When you unpack the ordered equipment, please make sure that all the equipment is complete.

After unpacking, your MC-TRANS™ should include the following:

- 1 x Teracue DVD which includes this user guide
- 1 x MC-TRANS™ Appliance
- 1 x Power cable

2.2 Setting up the MC-TRANS and Safety Instructions

Always read the instructions carefully and keep this user guide for future reference.

Please choose a suitable location for operating the MC-TRANS.

The MC-TRANS™ should not be exposed to the following:

- Moist and dusty environments.
- Air humidity above 80%.
- Avoid extreme vibrations or shocks.
- Direct sunlight and extreme heat.
- Temperatures below 0°C and above +65°C.
- Avoid quick and dramatic temperature changes.

2.3 Front Panel of MC-TRANS

The front panel of the MC-TRANS™ Appliance has 5 configuration buttons with which you can change the network configuration and with which you can perform a shutdown or a restart. The Appliance has also a LCD-Display at the front panel which shows also basic status information. See Figure 1.

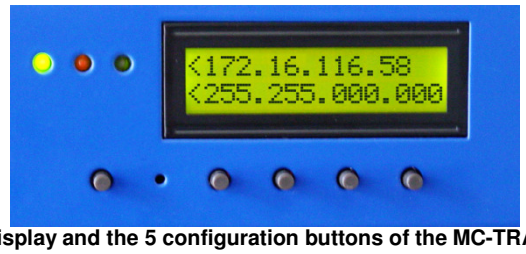

Figure 1: LCD-Display and the 5 configuration buttons of the MC-TRANS™ Appliance

2.3.1 Configuration Buttons

From the left to the right side there are the following configuration buttons at the front panel of the MC-TRANS™ Appliance and in Figure 2 are assigned the functions to the configuration buttons:

- ON / OFF
- \+ (to increase a value; In some cases this button has also the 'Cancel' function)
- \- (to decrease a value)
- Menu
- Enter

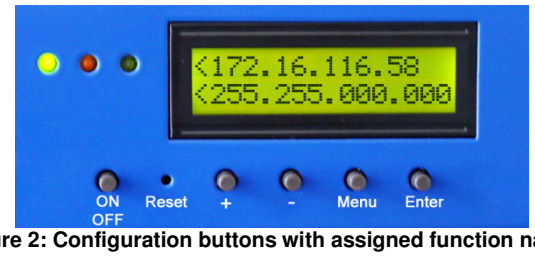

Figure 2: Configuration buttons with assigned function names

To start the MC-TRANS™ Appliance, please press the ON button. (leftmost of the 5 buttons)

To get into the menu, press the menu button (fourth button from the left side). To change the menu item, please press the menu button again.

Example: To get into the network menu push the menu button (fourth button from the left side) several times till 'Network' is shown in the display. Select the enter button (rightmost of the buttons). Now network settings can be changed. To increase the IP-address value use the + button (second button from the left side) and use the – button (third button from the left side) to decrease. To jump to the next IP-address part, press the menu button (fourth button from the left side). Accessing the numbers is only able from left to right. Confirm the entry with the enter button (rightmost of the buttons). After IP-address confirmation, you get into the network mask setting. The mask can be changed in bitmask size (8, 16 and 24 sizes). The gateway setting is the next setting. Finally select the enter button (rightmost of the buttons) to save the configuration.

2.4 Network Interfaces

The MC-TRANS™ Appliance has 2 network connectors which have the following default configuration:

- LAN 1 is configured to a static IP-address
- LAN 2 is configured for a DHCP IP-address

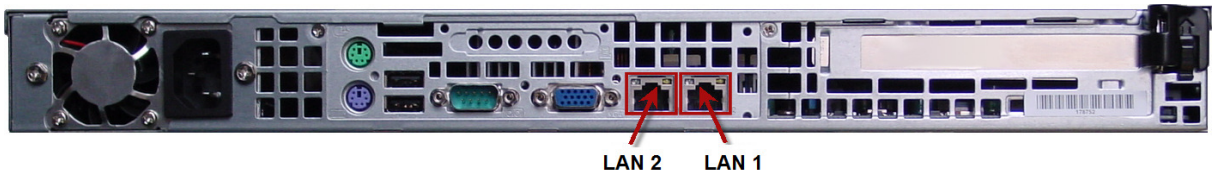

Figure 3: MC-TRANS™ Appliance rear side

3. MC-TRANS User Guide

This chapter gives you an overview over MC-TRANS and demonstrates the appliance's main functions.

.!. Before proceeding please be sure that the MC-TRANS is setup correctly and all necessary connections are established. That means enter minimum a power cable and a network cable into the MC-TRANS appliance.

Working and configuring Teracue's MC-TRANS is very easy.
You do not need to install an application or remote configuring software. If you know how to browse the internet, then you already know how to access and control the MC-TRANS, simply via web-browser.

3.1 Accessing and Configuring MC-TRANS

Open your standard web-browser and enter the IP-address of MC-TRANS in the address field and press the 'Enter' button. The IP-address of the MC-TRANS is shown at the LCD display of the MC-TRANS appliance. Depending on whether you have connected LAN 1 or LAN 2 with the network cable, you must enter the LAN 1 or LAN 2 IP-address in your standard web-browser.

Login username: admin
Login password: admin

.!. To be able to login to the MC-TRANS's user interface, your computer has to be in the same IP-address range (subnet).

You briefly might have to change your computers IP-address to be in the same subnet as the MC-TRANS. Only then you will be able to access the MC-TRANS and configure it.

3.2 Login

After typing the IP-address of your MC-TRANS into the browser and hitting enter, a login screen should appear. See Figure 4.

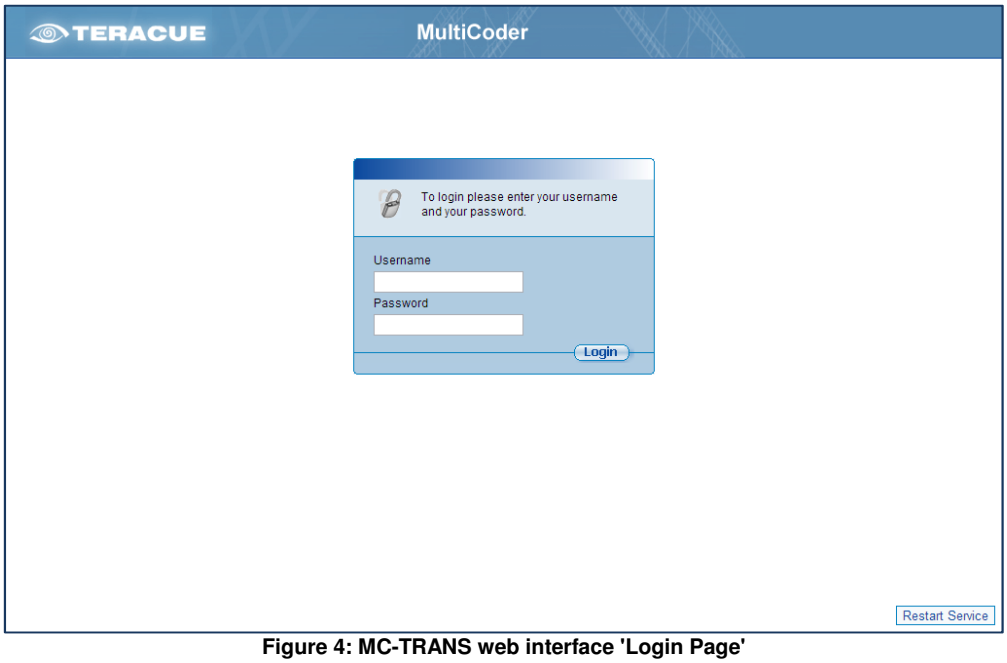

Figure 4: MC-TRANS web interface 'Login Page'

Enter your username and password and click on ‘login’.

Login username: **admin**
Login password: **admin**

3.3 Graphical User Interface of MC-TRANS

3.3.1 Navigational Menus

After successful login you have access to the MC-TRANS's configuration. All of the settings can be adjusted via web-browser.

Main Menu:
The main menu contains the 'Encoder', 'Network', 'System', 'Help' and 'LOGOUT' links from the top bar. See Figure 5.

Secondary Menu:
After selecting the desired menu item from the main menu, choose an area for configuration from the secondary menu, which is resides on the left-hand side. See Figure 5.

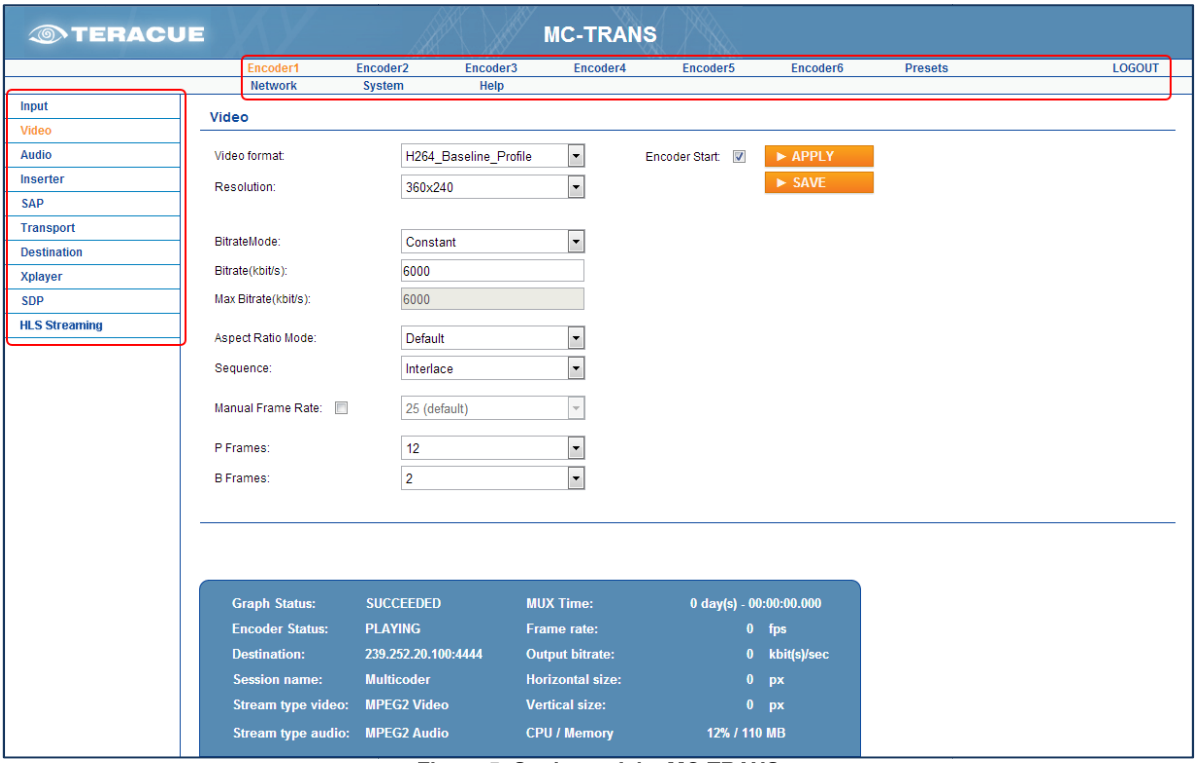

Figure 5: Settings of the MC-TRANS

3.3.2 'APPLY' and 'SAVE' Buttons

A change or multiple changes of the configuration settings will only take effect after the '► APPLY' button is pressed.
MC-TRANS will then start working with the new parameters, but the parameters will not be saved to the MC-TRANS. Applied settings are not saved and will be lost after a reboot.
Good for quickly testing and applying different settings.

Same as the '► APPLY' button, **but** the configuration parameters will be applied and saved to the MC-TRANS memory.
Saved parameters will be used by MC-TRANS even when MC-TRANS is turned off & on or after a reboot has taken place.
Good for permanently saving the MC-TRANS configuration.

3.3.3 Blue Info-Box

The blue Info-Box shows read-only state information for the user, see Figure 6. Table 1 contains the description of the blue Info-Box.

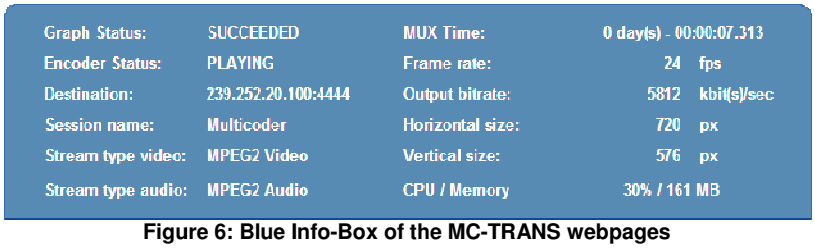
Graph Status: SUCCEEDED
MUX Time: 0 day(s) - 00:00:07.313
Encoder Status: PLAYING
Frame rate: 24 fps
Destination: 239.252.20.100:4444
Output bitrate: 5812 kbit(s)/sec
Session name: Multicoder
Horizontal size: 720 px
Stream type video: MPEG2 Video
Vertical size: 576 px
Stream type audio: MPEG2 Audio
CPU / Memory 30% / 161 MB

Figure 6: Blue Info-Box of the MC-TRANS webpages

Information:	Description:
Graph Status:	Shows whether the MC-TRANS graph has been built up successfully.
Encoder Status:	Shows whether the MC-TRANS is transcoding or not.
Destination:	Shows the specified destination IP-address and port.
Session name:	Shows the specified SAP session name of the MC-TRANS.
Stream type video:	Shows the selected video codec for the MC-TRANS output stream.
Stream type audio:	Shows the selected audio codec for the MC-TRANS output stream.
MUX Time:	Shows how long the encoding process runs without any breaks.
Frame rate:	Shows the output framerate of the MC-TRANS stream.
Output bitrate:	Shows the output transport bitrate.
Horizontal size:	Shows the horizontal size of the output stream.
Vertical size:	Shows the vertical size of the output stream.
CPU / Memory:	Shows the CPU load and the used memory of the MC-TRANS appliance.

Table 1: Description of the blue Info-Box of MC-TRANS webpages

3.4 MC-TRANS Configuration

3.4.1 Menu: Encoder / Input

Under the menu option ‘Encoder / Input’ you define the input option of the MC-TRANS. Here you can set which input stream the MC-TRANS shall transcode. See Figure 7.

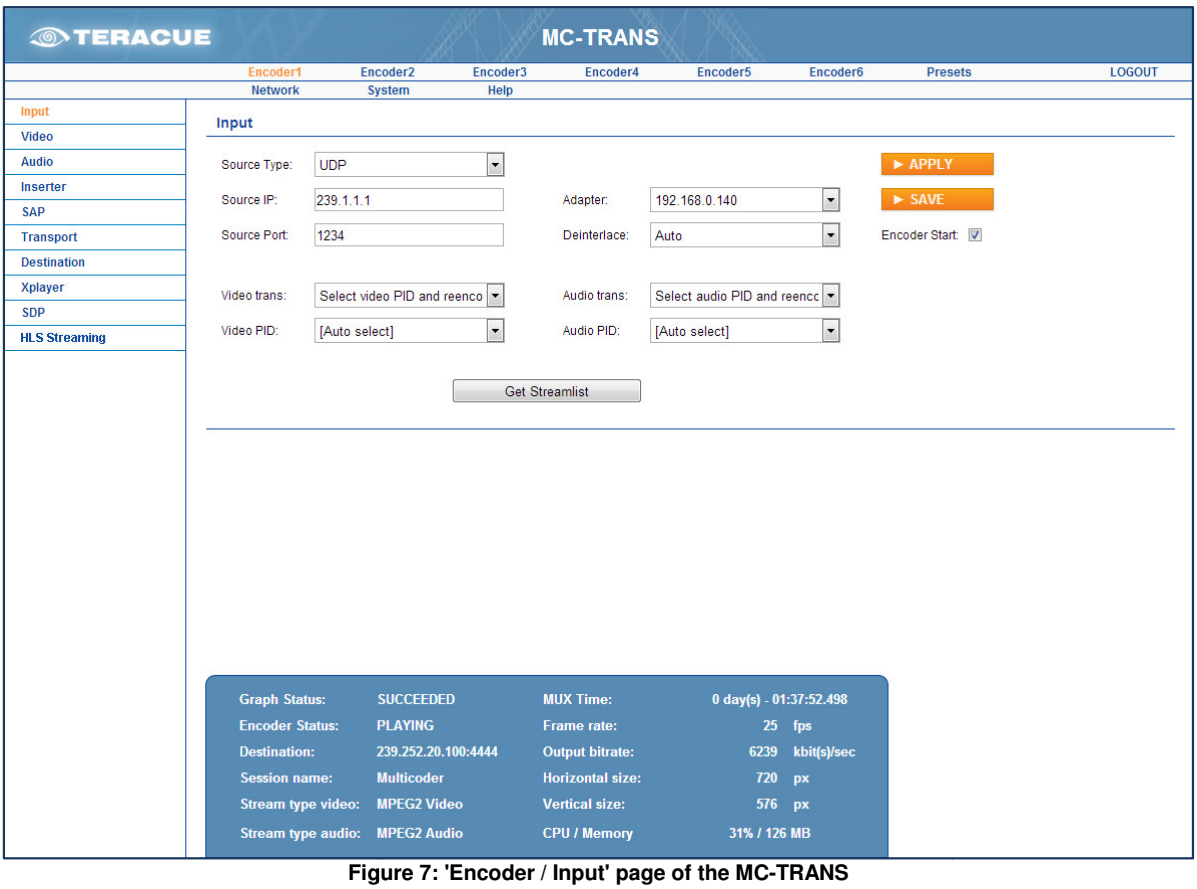

Figure 7: 'Encoder / Input' page of the MC-TRANS

There are two ways to set the input:

- First you set ‘Source Type’ to ‘UDP’. In this case you have to give the current ‘Source IP’, ‘Source Port’, ‘Adapter’ settings.
- Second you set ‘Source Type’ to ‘URL’. In this case you must enter an URL to define the source path. example:

  rtp://239.1.1.2:1234
  rtsp://192.168.0.229/axis-media/media.3gp

Table 2 describes the ‘Encoder / Input’ page of the MC-TRANS.

Settings:	Description:
Source IP:	Specifies the unicast or multicast IP-address of the input stream which should be transcoded. If you want to receive a unicast stream, you must enter here the IP-address of your MC-TRANS.
Source Port:	Specifies the port number of the input stream which shall be transcoded.
Adapter:	Specifies the IP-address of the used network card of the MC-TRANS, in which the desired input stream is available. If several network ports are used, the MC-TRANS lists all detected network port in this dropdown field. So you can select the LAN on which your desired stream is available.
URL:	Here you must enter an URL where the stream comes form. Example: rtsp://85.23.123.2/
Deinterlace:	Enables / Disables deinterlacing.
Video trans:	Specifies whether you want to edit the video stream or not. If you want to edit the video stream, please select: **'Select video PID and reencode video'.** If you won't edit the video stream, please select: **'Select video PID and multiplex video'.**
Video PID:	Lists all existing video PIDs which are contained in a MPTS (Multi-Program-Transport-Stream). Please select your desired video on the basis of the listed video PIDs. This field can be refreshed by clicking the 'Get Streamlist' button.
Audio trans:	Specifies whether you want to edit the audio stream or not. If you want to edit the audio stream, please select: **'Select audio PID and reencode audio'.** If you won't edit the audio stream, please select: **'Select audio PID and multiplex audio'.** If you won't edit the audio stream, but you want to stream all audio PIDs, please select: **'Bridge all audio'.** **.!. Note: If you not reencode the audio, the audio menu setting is disabled.**
Audio PID:	Lists all existing audio PIDs which are contained in a MPTS (Multi-Program-Transport-Stream). Please select your desired audio on the basis of the listed audio PIDs. This field can be refreshed by clicking the 'Get Streamlist' button.
Get Streamlist:	Refreshes the drop-down fields 'Video PID' and 'Audio PID'.

Table 2: Description of the 'Encoder/Input' webpage of MC-TRANS

3.4.2 Menu: Encoder / Video

Figure 8 shows the 'Encoder / Video' page of the MC-TRANS and Table 3 describes it. Here you can change the video format which determinates the encoder type. The type can be MPEG-2 or H.264. The video format has different levels: 'Baseline', 'Main', 'High'. If you choose higher level the quality will be better, and the resolution will be higher.

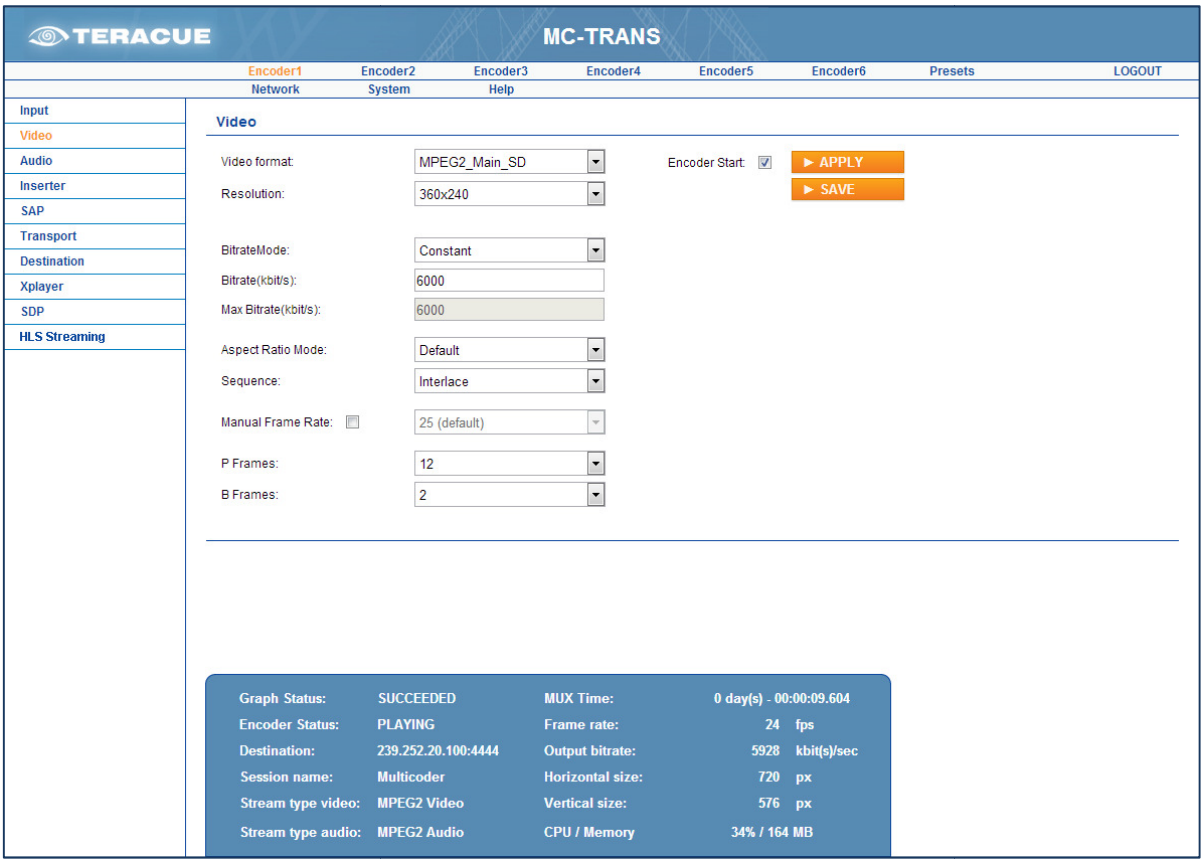

Figure 8: 'Encoder / Video' page of the MC-TRANS

Settings:	Description:
Video format:	Specifies the output video format with the used profiles. Depending on the selected video format, the individual options, like 'Resolution', have different selectable variables.
Encoder Start:	Stops or starts the encoding process.
Resolution:	Specifies the video encoding resolution. The available resolutions depend on the chosen video format.
BitrateMode:	Specifies the used bitrate mode of the output stream.
Bitrate(kbit/s):	Specifies the used video bitrate of the output stream. For the case when you have chosen the variable bitrate as the bitrate mode: The 'Bitrate' field specifies the average bitrate. To set the maximum bitrate, you must use the 'Max Bitrate' field. **.!. The maximum bitrate is limited by the used MPEG-2 or H.264 level.**
Max Bitrate(kbit/s):	Specifies the used maximum bitrate of the output stream when variable bitrate mode is choosen. **.!. The maximum bitrate is limited by the used MPEG-2 or H.264 level.**
Aspect Ratio Mode:	Specifies the aspect ratio. If at the input stream is the WSS (Wide Screen Signal) flag set then the MC-TRANS can detect whether the input signal is in 16:9 or in 4:3, when the 'Aspect Ratio Mode' option is switched to 'Auto'. If at the input stream is not the WSS flag set, although you have a '16:9' stream, you can manually switch in this field the MC-TRANS to '16x9', '4x3' or '1x1.
Sequence:	Specifies the interlaced/progressive mode of the MPEG-2 sequence. You can choose between: ▪ Interlaced ▪ Progressive This field appears only when MPEG-2 is chosen in 'Video format' field.
Coding Mode:	Specifies the coding mode of the H.264 output stream. You can choose between: ▪ Progressive frame ▪ Interlaced fields ▪ Interlaced frame This appears only when H.264 is chosen in 'Video format' field.
Manual Frame Rate:	Specifies the frame rate of the output stream.
CPB Size (bytes):	Specifies the size of the coded picture buffer (CPB). The buffer size will be changed automatically and depends at the entered bitrate. This field appears only when H.264 is chosen in the 'Video format' field. **.!. We recommend not changing the CPB buffer size.**
P-Frames:	Specifies the value of used P-frames.
Entropy coding:	Specifies the used entropy coding type CAVLC (Context-adaptive Variable Length Coding) or CABAC (Context-based Adaptive Binary Arithmetic Coding). This field appears only when H.264 is chosen in the 'Video format' field.
B-Frames:	Specifies the value of used B-frames.

Table 3: Description of the 'Encoder/Video' webpage of the MC-TRANS

3.4.3 Menu: Encoder / Audio

Figure 9 shows the 'Encoder / Audio' page of the MC-TRANS.

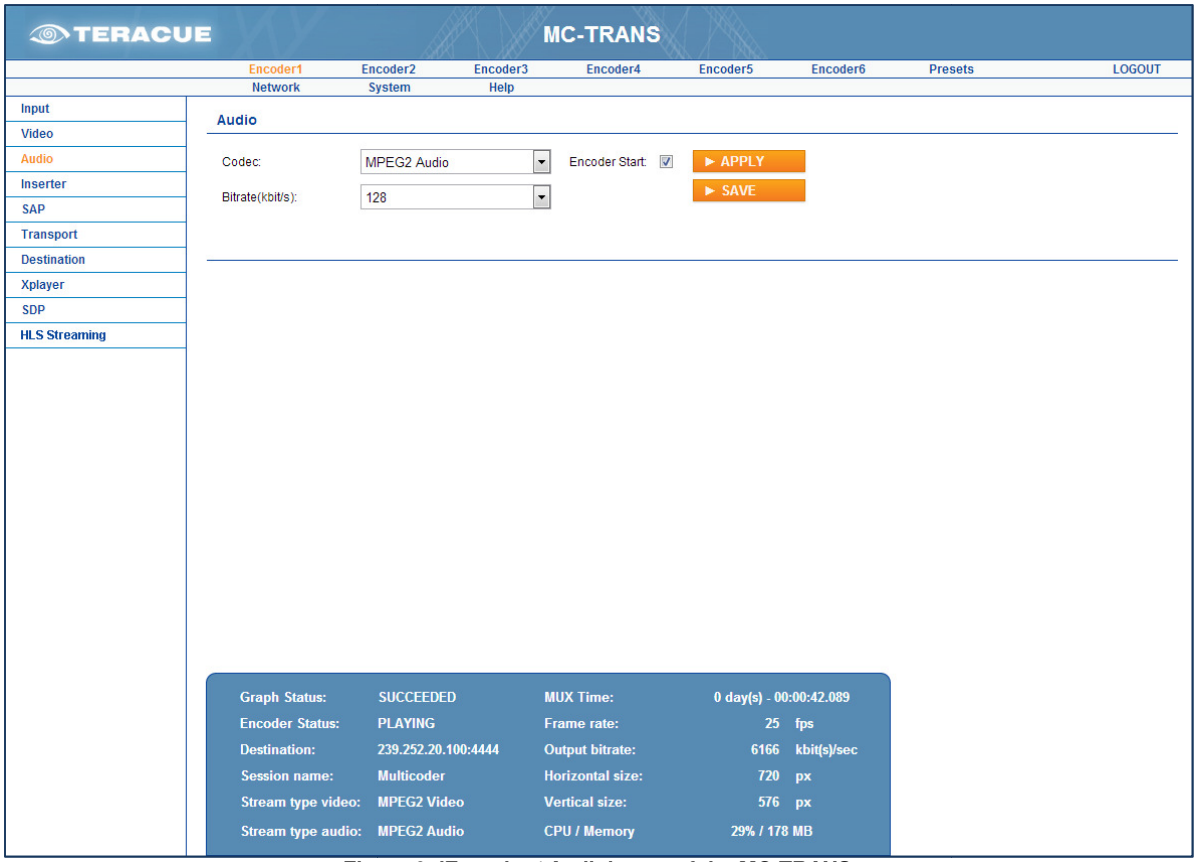

Figure 9: 'Encoder / Audio' page of the MC-TRANS

.!. Note: This setting is only available when the 'Audio trans' option in the 'Encoder/Input' webpage is set to 'Select audio PID and reencode audio'.

Table 4 describes the 'Encoder / Audio' page of the MC-TRANS.

Settings:	Description:
Codec:	Specifies the used audio codec of the output stream. You can choose between: ▪ MPEG2 Audio (MPEG-2 Layer II) ▪ AAC Audio (MPEG-4 AAC LC)
Bitrate(kbit/s):	Specifies the used audio bitrate of the output stream.

Table 4: Description of the 'Encoder/Audio' webpage of the MC-TRANS

3.4.4 Menu: Encoder / Inserter

Figure 10 shows the ‘Encoder / Inserter’ page of the MC-TRANS.

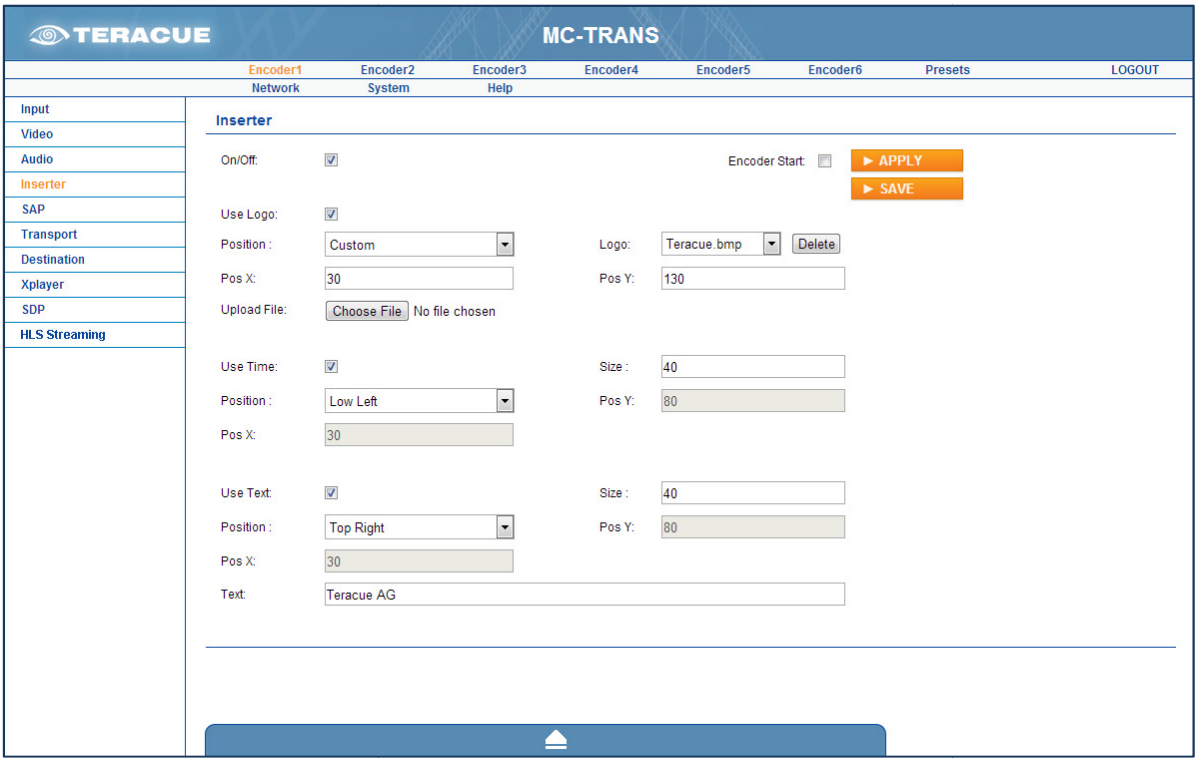

Figure 10: 'Encoder / Inserter' page of the MC-TRANS

Table 5 describes the ‘Encoder / Inserter’ page of the MC-TRANS.

Settings:	Description:
On/Off:	Enables / Disables the inserter graph.
Use Logo:	Enables / Disables the logo inserter.
Logo:	Lists all logos which you have uploaded to the MC-TRANS.
‘Delete’ Button:	Deletes the selected logo from the ‘Logo’ list.
Upload File:	Specifies the path of the logo image which shall be uploaded.
‘Durchsuchen...’ Button:	Browses to the logo image which shall be uploaded.
Use Time:	Enables / Disables the time inserter.
Use Text:	Enables / Disables the text inserter.
Text:	Specifies the text which shall be inserted in the video stream.
Position:	Specifies a general position of the inserted logo/time/text. If you select the parameter ‘Custom’ in the drop-down field ‘Position’, you must enter the x- and y- coordinates in the ‘Pos X’ and ‘Pos Y’ fields.
Pos X:	Specifies an individual x-position of the inserted logo/time/text. This field is only available when the parameter ‘Custom’ is selected in the ‘Position’ drop-down field.
Pos Y:	Specifies an individual y-position of the inserted logo/time/text. This field is only available when the parameter ‘Custom’ is selected in the ‘Position’ drop-down field.
Size:	Specifies the font size of the text and time insertion.

Table 5: Description of the 'Encoder/Inserter' webpage of the MC-TRANS

3.4.5 Menu: Encoder / SAP

The Session Announcement Protocol (SAP) is a protocol for broadcasting multicast session information. A SAP listening application can listen to the well-known SAP multicast address and construct a guide of all advertised multicast sessions. SAP was published by the IETF as RFC 2974.

.!. According to this specification and standard SAPs are sent on the multicast address 224.2.127.254 on port 9875.

A SAP is used to label a stream to guarantee an effective workflow. Streams with SAPs can easily be located, selected and viewed – due to their description. Please see the figure below to get an overview of all the properties that can be defined.

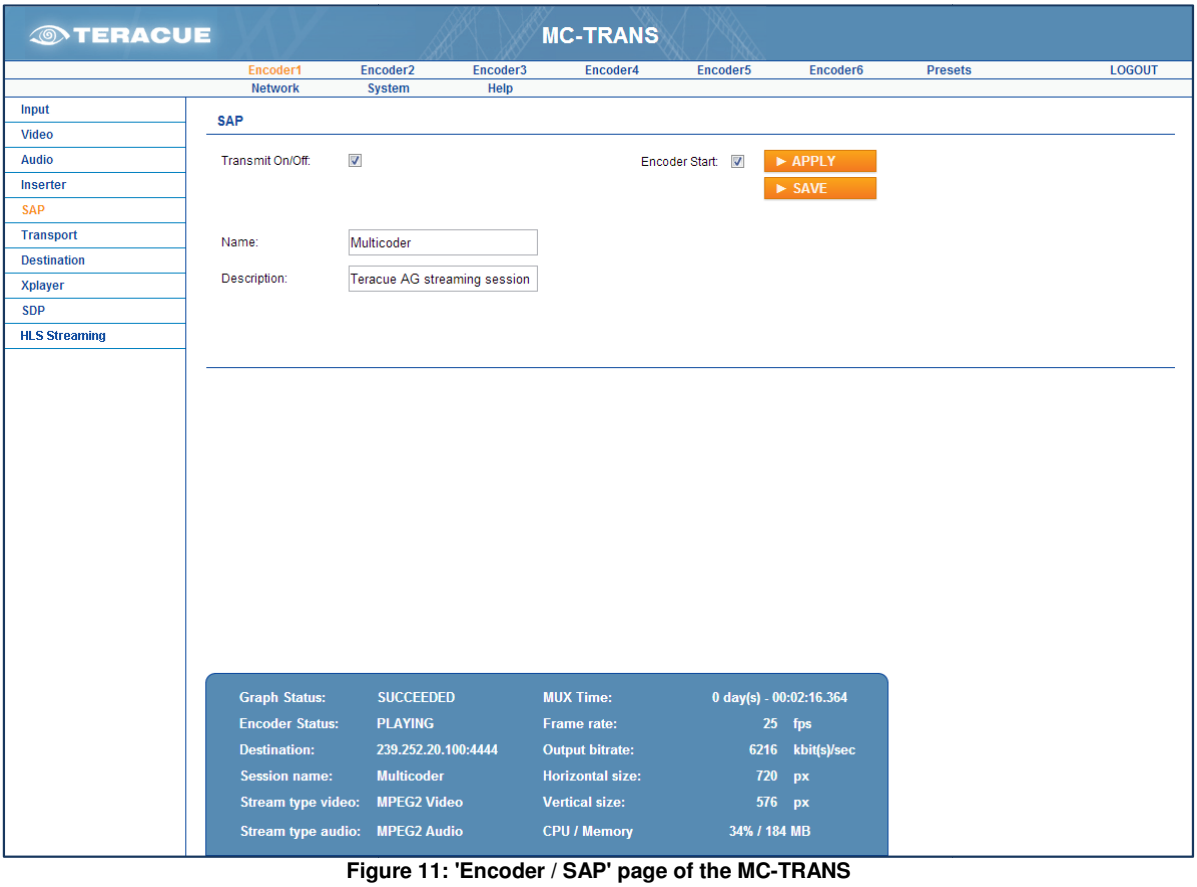

Figure 11: 'Encoder / SAP' page of the MC-TRANS

Table 6 describes the 'Encoder / SAP' page of the MC-TRANS.

Settings:	Description:
Transmit On/Off:	Enables/Disables the transfer of the SAP messages.
Session Name:	Specifies the session name of the stream which is attached in the SAP messages.
Session Description:	Specifies the description of your session.

Table 6: Description of the 'Encoder/SAP' webpage of the MC-TRANS

3.4.6 Menu: Encoder / Transport

Figure 12 shows the ‘Encoder / Transport’ page of the MC-TRANS.

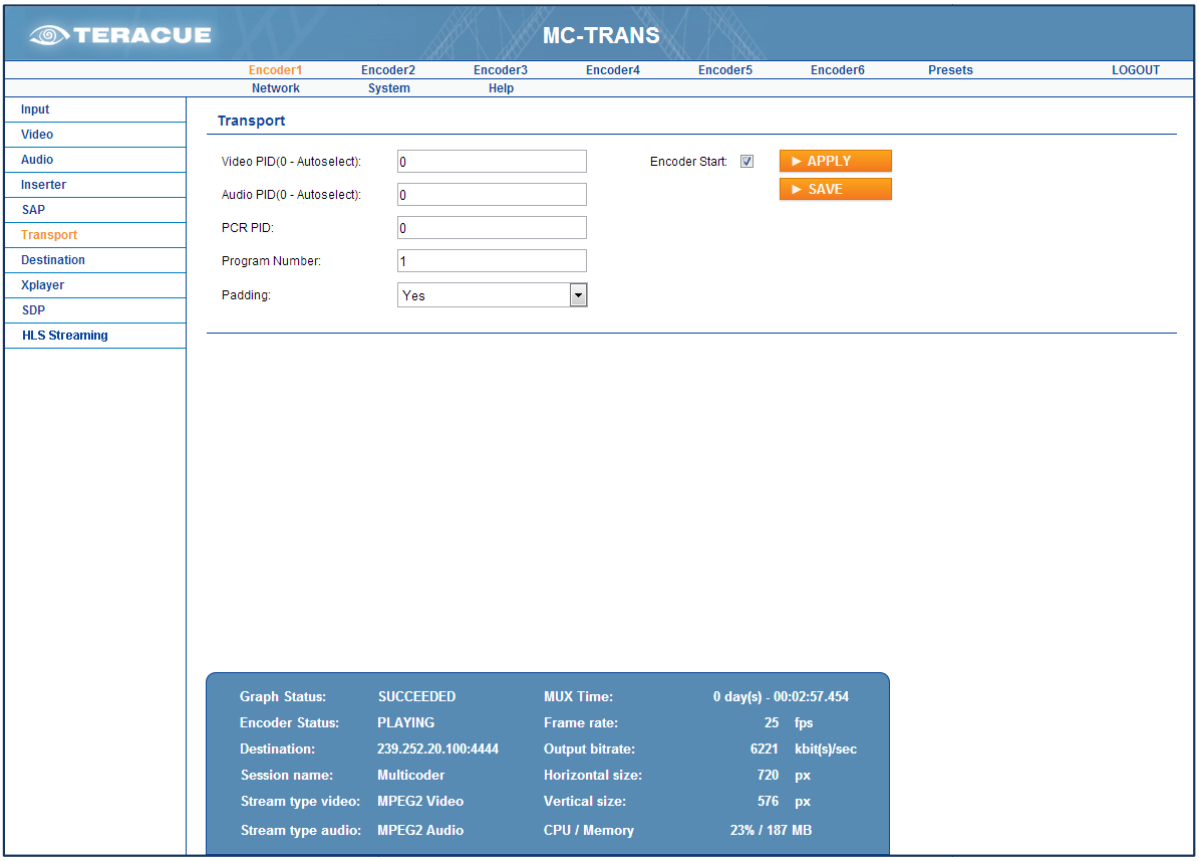

Figure 12: 'Encoder / Transport' page of the MC-TRANS

Table 7 describes the ‘Encoder / Transport’ page of the MC-TRANS.

Settings:	Description:
Video PID (0 – Autoselect):	Specifies the video PID of the output stream. If the ‘Video PID’ has the value ‘0’, the MC-TRANS uses the same PID values from the input stream.
Audio PID (0 – Autoselect):	Specifies the Audio PID of the output stream. If the ‘Audio PID’ has the value ‘0’, the MC-TRANS uses the same PID values from the input stream.
PCR PID:	Specifies the PID (Packet Identifier) for the program clock references (PCR).
Program Number:	Specifies the program number of the output stream.
Padding:	Enables / Disables padding option.

Table 7: Description of the 'Encoder/Transport' webpage of the MC-TRANS

3.4.7 Menu: Encoder / Destination

The MC-TRANS is capable to encode a video either as a unicast stream or a multicast stream. According to the entered destination IP-address, the MC-TRANS will automatically recognize whether it should be a unicast or multicast stream. Figure 13 shows the 'Encoder / Destination' page of the MC-TRANS.

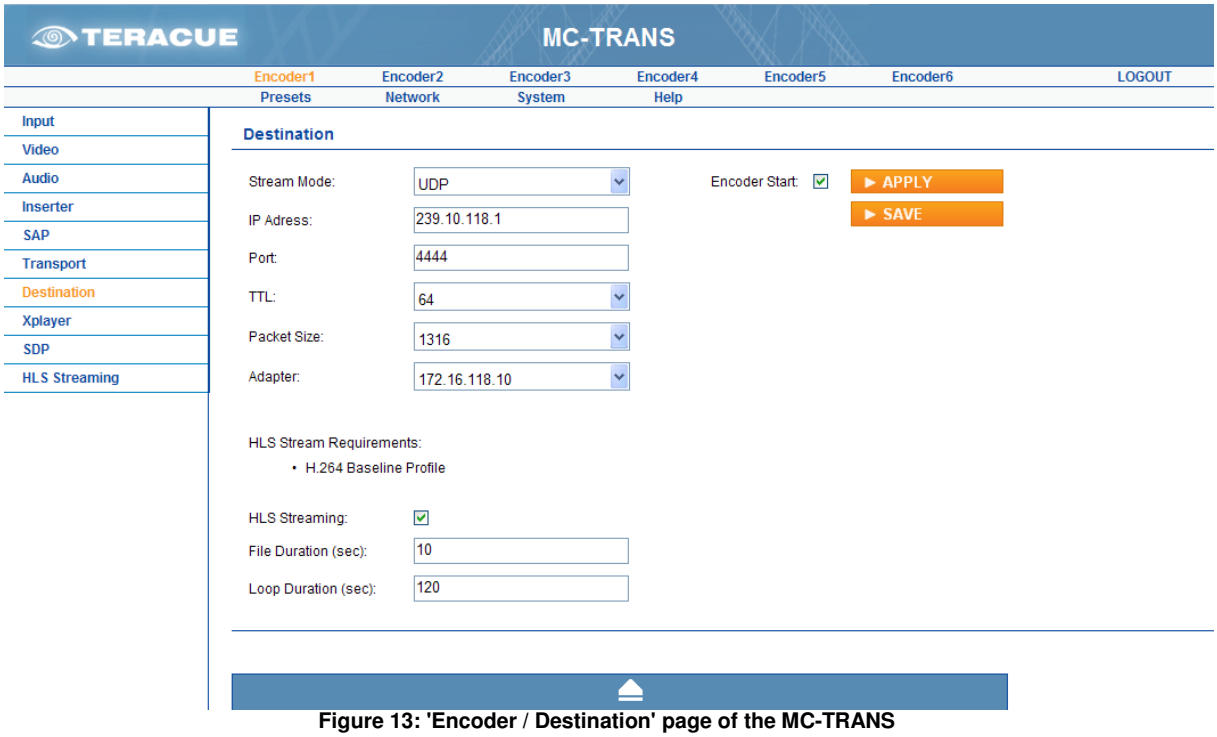

Figure 13: 'Encoder / Destination' page of the MC-TRANS

Table 8 describes the 'Encoder / Destination' page of the MC-TRANS.

Settings:	Description:
Stream Mode:	Specifies the used stream mode. You can choose between: 'UDP', 'RTP over UDP', 'Transport RTP over UDP'.
IP Address:	Specifies the destination IP-address which should the MC-TRANS use for the output stream. If you want to stream a multicast stream: Please enter in the 'IP Address' field your desired multicast IP-address, e.g. 239.252.20.100 **.!. Some multicast addresses are reserved by the 'Internet Assigned Numbers Authority' (IANA) for specific purposes. To avoid conflicts concerning multicast addresses, please always use private addresses. The address range 239.252.0.0 – 239.255.255.255 is approved for private use only.** If you want to stream a unicast stream: Enter in the 'IP Address' field the IP-address of the destination, e. g. the IP-address of a DEC-200™.
Port:	Specifies the port number of the output stream.
TTL:	Specifies the number of routers/switches how many routers/switches the stream is allowed to travel/pass.
Packet Size:	Specifies the packet size in bytes. The packet size can be changed in 188 byte steps. The range value goes from 1316 till 8836 bytes. **.!. We recommend using a packet size of 1316 Bytes.**

Adapter:	Specifies the IP-address of the used network card in which the desired output stream will be sent. If several network ports are used, the MC-TRANS lists all detected network port in this drop-down field.
HLS Streaming:	Enables / Disables the HTTP streaming to an Apple device like iPad. This check-box must be enabled, when you want to use the 'HLS Streaming'-Link inside the 'Encoder' menu. If you check the 'HLS Steraming' checkbox, the new menu point 'HLS Streaming' appears, where you can check the HLS stream. See also chapter 3.4.3 on page 24. The requirements must be satisfied to use this stream correctly.
File Duration (sec):	Specifies the file duration of the HTTP streaming files.
Loop Duration (sec):	Specifies the duration for a loop of HTTP streaming files. For example: The file duration has 10 seconds and the loop duration is set to 120 seconds, then the files will be streamed 12 times as a loop.

Table 8: Description of the 'Encoder/Destination' webpage of the MC-TRANS

3.4.1 Menu: Encoder / Xplayer

The menu ‘Xplayer’ starts the ‘Standalone XPlayer’, if an ‘XPlayer’ is installed on the client PC. You can start the ‘XPlayer’ by clicking the Xplayer-Link inside the ‘Encoder’ menu.

Afterwards the ‘XPlayer’ automatically displays the output stream of the MC-TRANS.

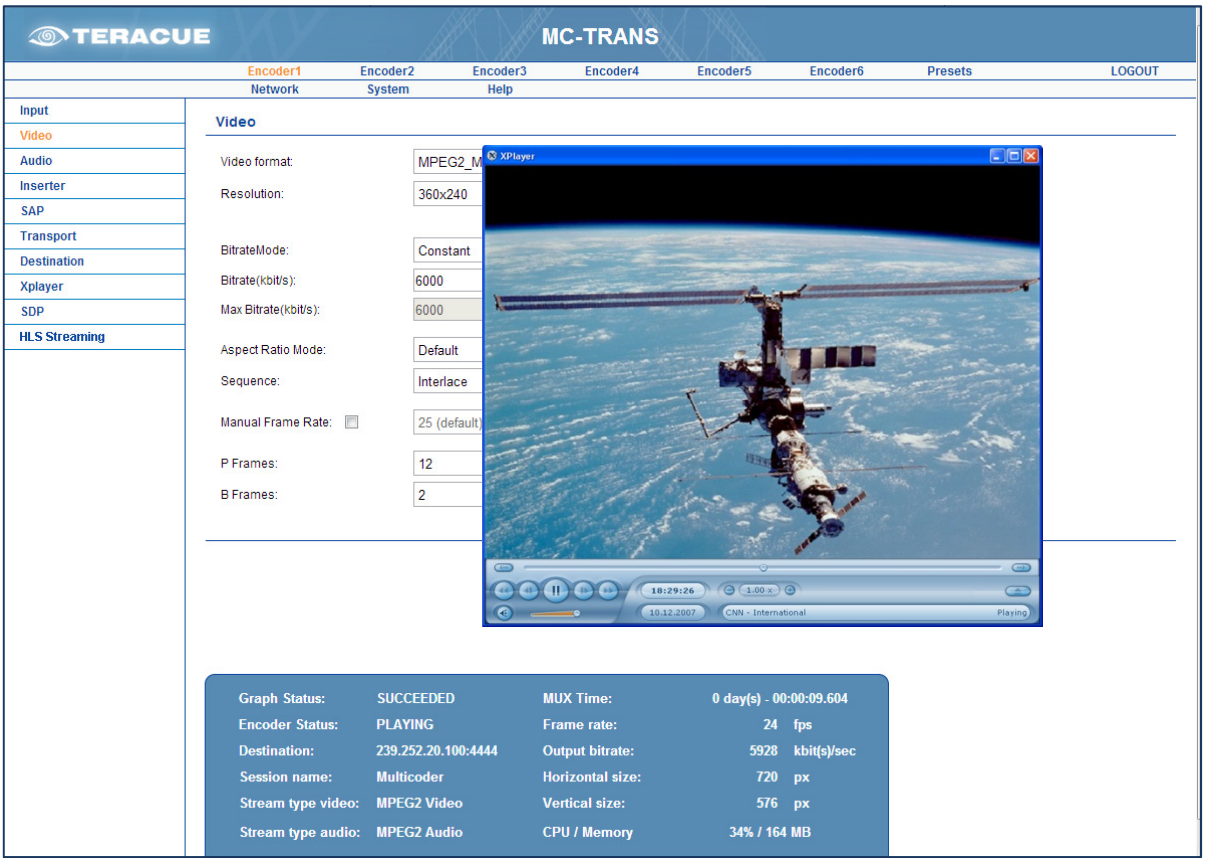

Figure 14: 'Encoder / Xplayer' page with opened XPlayer

If the XPlayer is not installed on the client PC, the Xplayer-Link will have no function.

.!. Requirement for this feature: The XPlayer must be installed.

3.4.2 Menu: Encoder / SDP

The menu ‘SDP’ starts the VLC Player, if a VLC Player is installed on the client PC. You can start the VLC Player by clicking the SDP-Link inside the ‘Encoder’ menu.

Afterwards you will be asked whether you want to save or open the ‘Encoder.sdp’ file. When you open this file, the VLC Player automatically displays the output stream of the MC-TRANS.

If the VLC Player is not installed on the client PC, the SDP-Link will have no function.

.!. Requirement for this feature: The VLC Player must be installed.

3.4.3 Menu: Encoder / HLS Streaming

If you want to receive the MC-TRANS stream with an Apple device like the iPad or on an Android device, you can open the web pages of MC-TRANS and click the 'HLS Streaming'-Link inside the 'Encoder' menu. Then the apple or android player will automatically display the output stream of the MC-TRANS. If not, follow the link to the m3u8 file.

If you want to watch the stream on PC browser, you have to install VLC player web browser plugin or media player browser plugin.

At the apple device, the built in player can play the stream.

If you don't see this menu option, you have to go to the 'Encoder / Destination' page and enable the 'HLS Streaming' check-box. See chapter 3.4.7 on page 20.

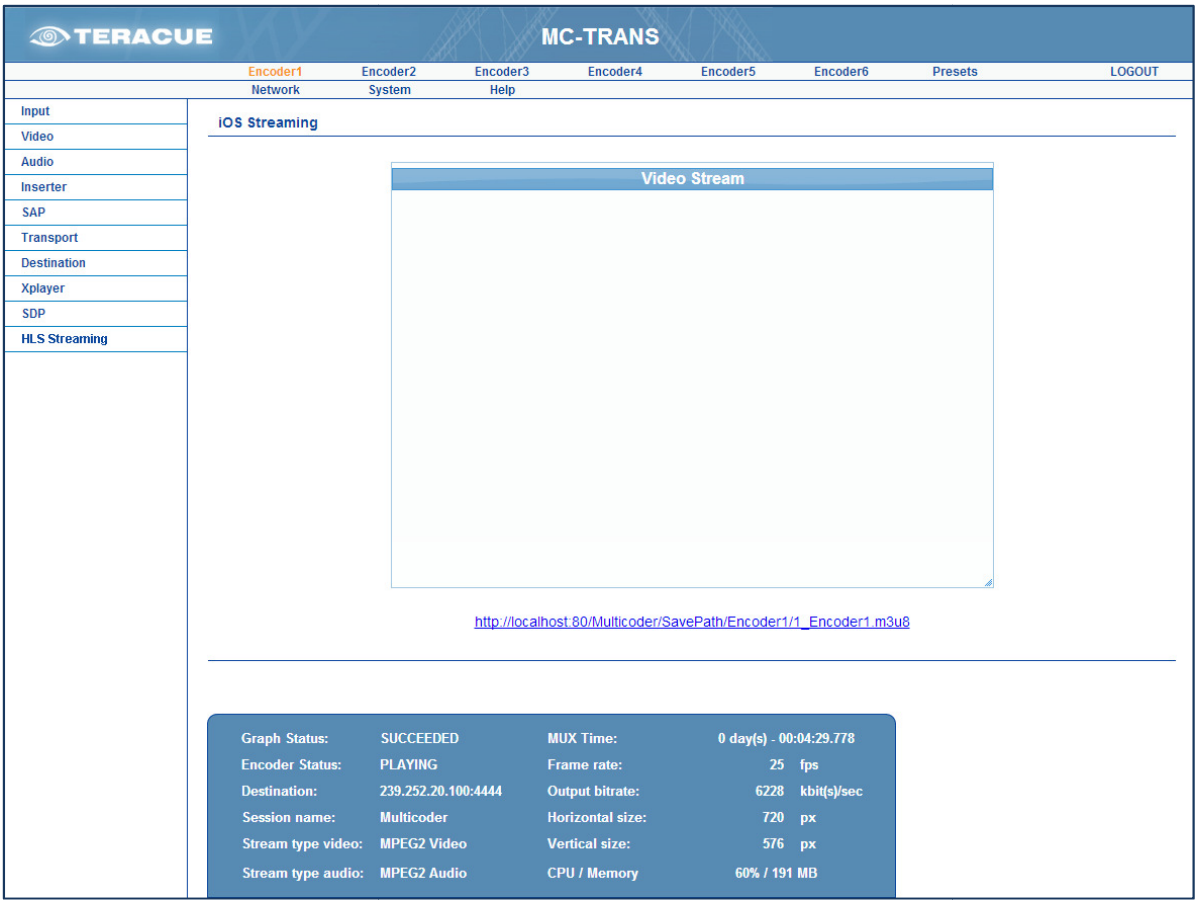

Figure 15: 'Encoder / HLS Streaming' page with the m3u8 link

.!. Requirement for this feature to play at PC: VLC player or Media player

3.4.4 Menu: Presets / Management

Figure 16 shows the 'Presets / Management' page of the MC-TRANS. Here you are able to manage the preset files of the MC-TRANS. The preset file contains all the settings what are needed for the encoders. So if you set the encoders options, you can make a backup save of these settings. You can upload, download, or delete the saved settings files in this page.

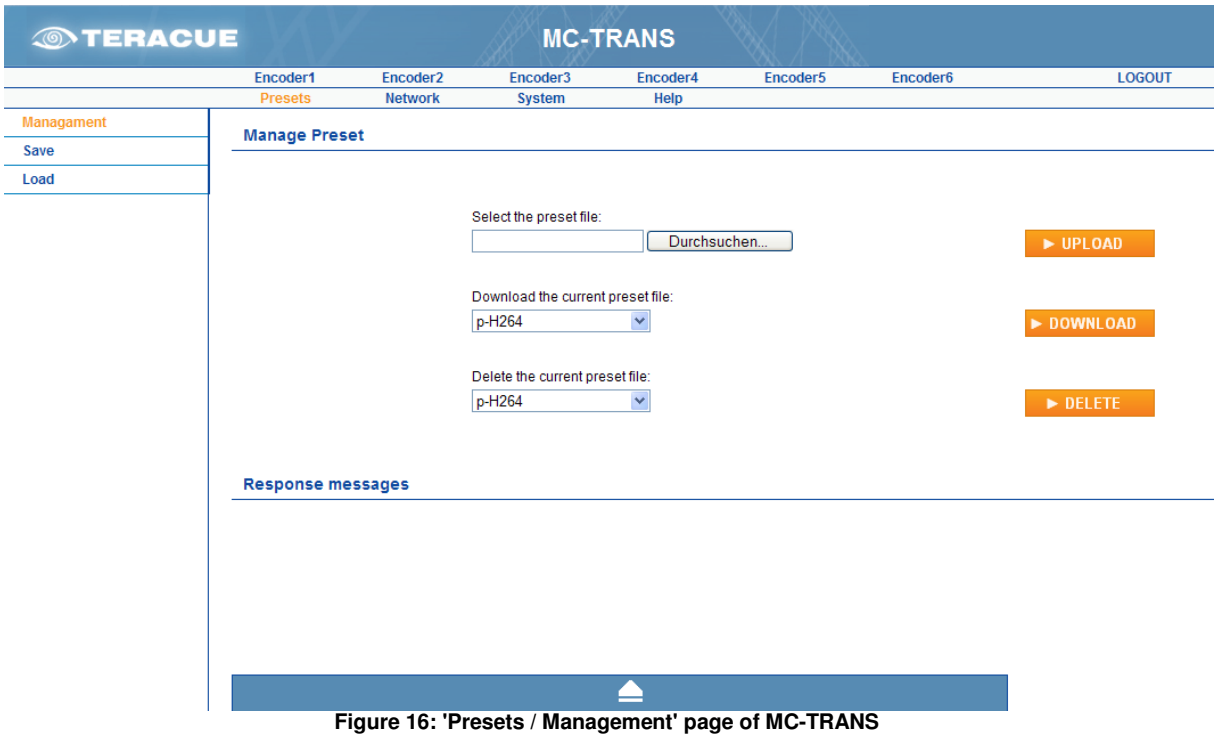

Figure 16: 'Presets / Management' page of MC-TRANS

3.4.5 Menu: Presets / Save

Here you can save the current settings of the encoders to a preset file. If you fill the new preset field, the settings will be saved in a new preset file. If you leave it blank, the settings saved in the selected preset file. You can see the 'Presets / Save' page at Figure 17.

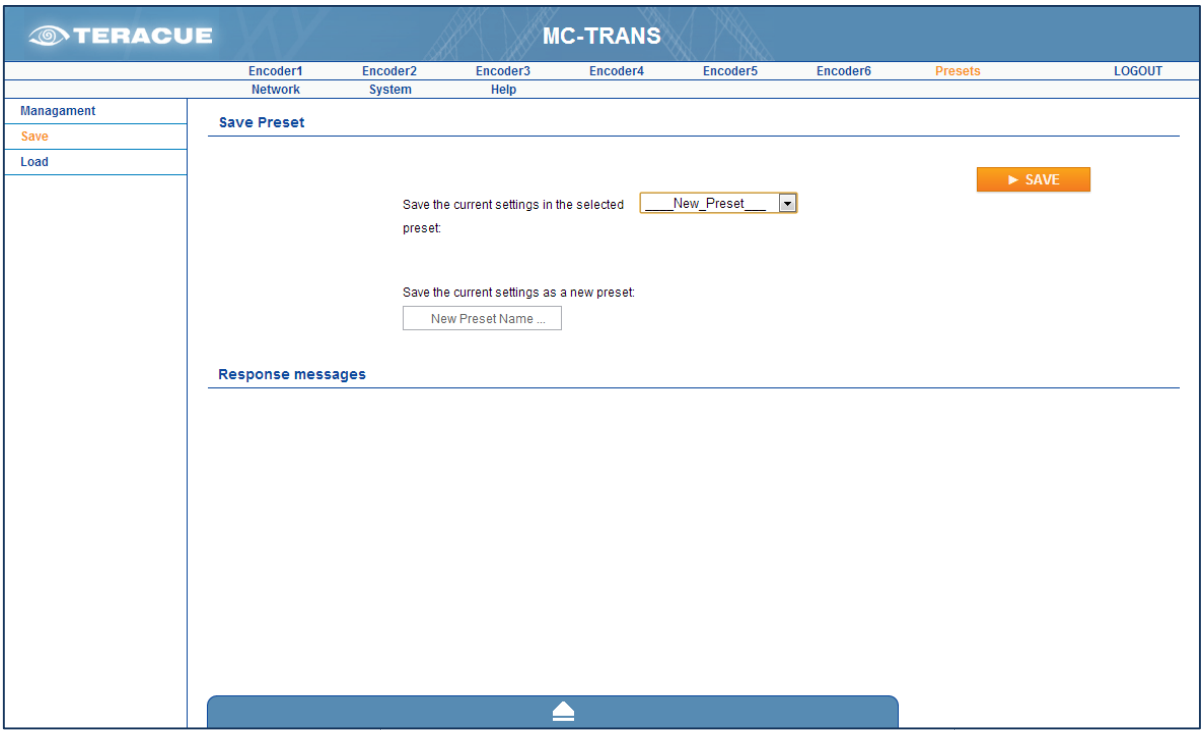

Figure 17: 'Presets / Save' page of the MC- TRANS

3.4.6 Menu: Presets / Load

On this page you can load a saved preset file setting. The preset file contains all of the settings of the encoders. If you load a preset file, the current settings will be override by the loaded preset file.

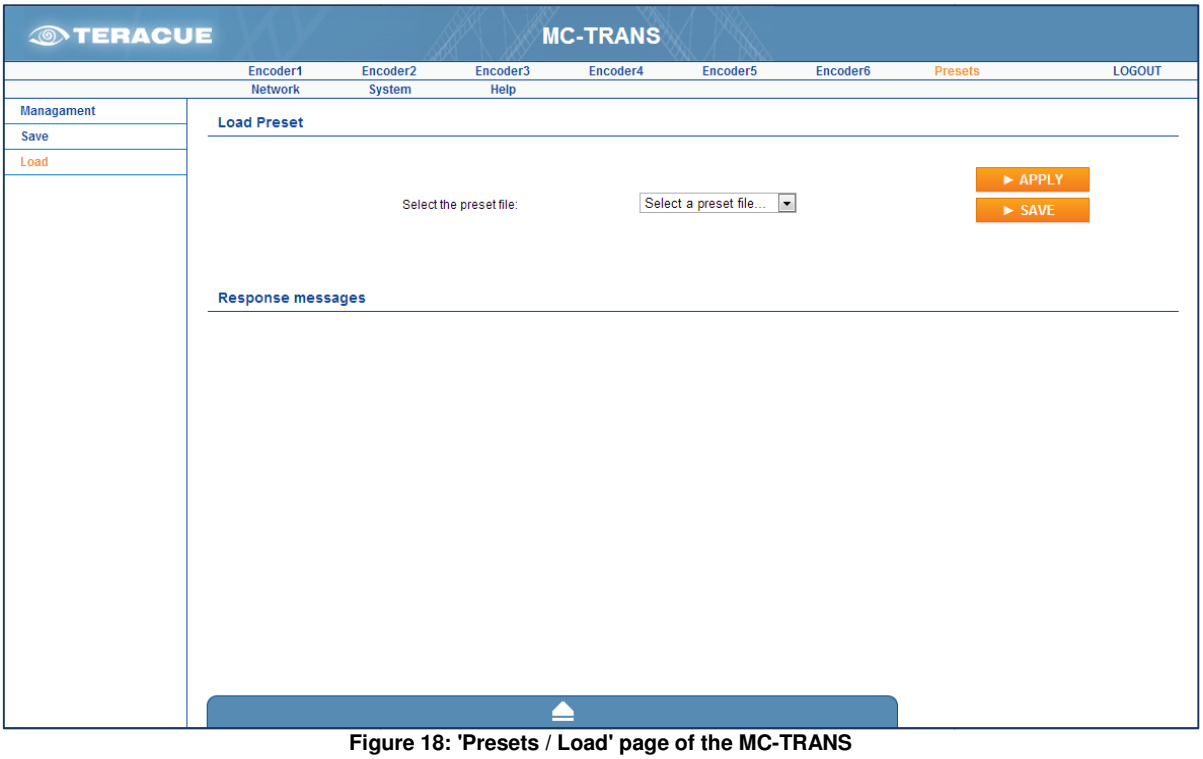

Figure 18: 'Presets / Load' page of the MC-TRANS

3.4.7 Menu: Network / Settings

Figure 19 shows the 'Network / Settings' page of the MC-TRANS. Here you are able to set the MC-TRANS's own IP-address, subnet mask, gateway address and you can define the MC-TRANS's host name.

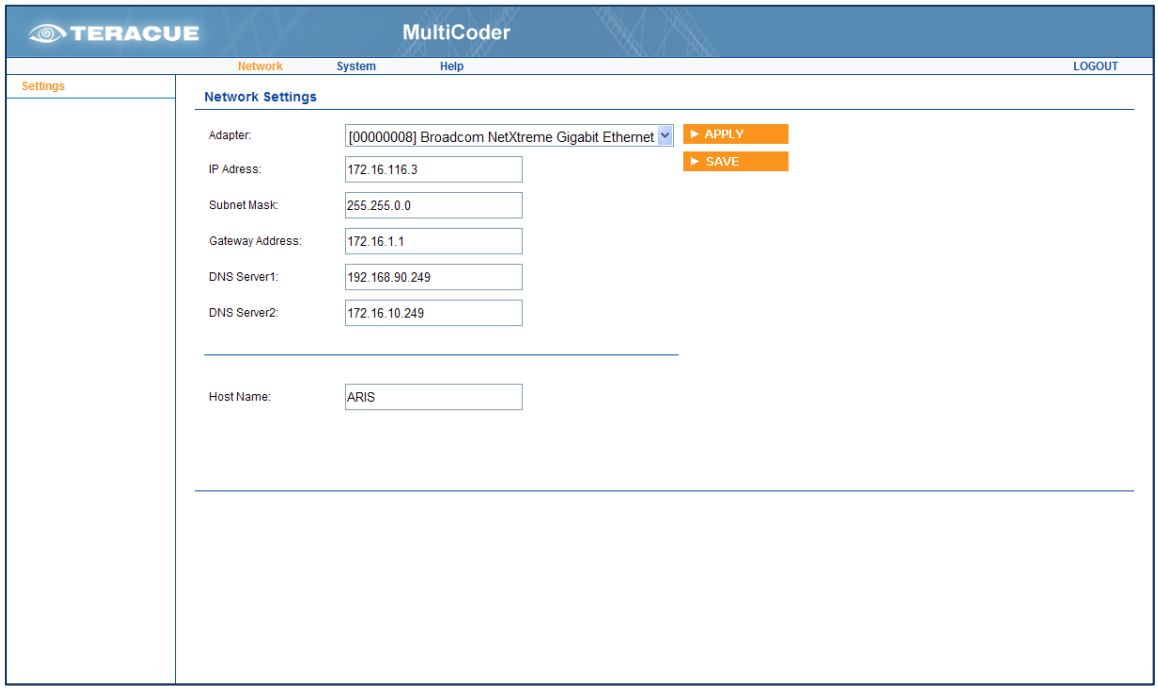

Figure 19: 'Network / Settings' page of the MC-TRANS

Table 9 describes the 'Network / Settings' page of the MC-TRANS

Settings:	Description:
Adapter:	Specifies the network card for which the settings below are.
IP Address:	Specifies the IP-address of the MC-TRANS. The IP-address is an identifier for your MC-TRANS in the TCP/IP network. Networks use the TCP/IP protocol route messages based on the IP-address of the destination.
Subnet Mask:	Specifies the subnet mask of the MC-TRANS. A subnet mask is a 32-bitmask used to divide an IP-address into subnet and specify the networks available hosts. E.g.: 255.255.0.0 is the net mask for a class-B IP-address like 172.16.20.100.
Gateway Address:	Defines IP-address of your gateway. The gateway is commonly the address of the network device such as a network router.
DNS Server1:	Specifies the IP-address of the primary used DNS-Server.
DNS Server2:	Specifies the IP-address of the secondary DNS-Server.
Host Name:	Specifies the hostname of the MC-TRANS Please enter your desired hostname of the MC-TRANS.

Table 9: Description of the 'Network/Settings' webpage of the MC-TRANS

.!. When you want to change the network settings of your MC-TRANS, you must stop at first the MC-TRANS server service. Therefor please go to the 'System / Service Stop' webpage of the MC-TRANS, disable the 'Start/Stop service' check-box and click the 'Apply' button. Now you can change the network settings of your MC-TRANS. After changing the network settings of your MC-TRANS, please do not forget to enable the MC-TRANS server service again.

3.4.8 Menu: System / Date/Time

You can set the time and date for the MC-TRANS in the menu ‘System/Date/Time’. See Figure 20.

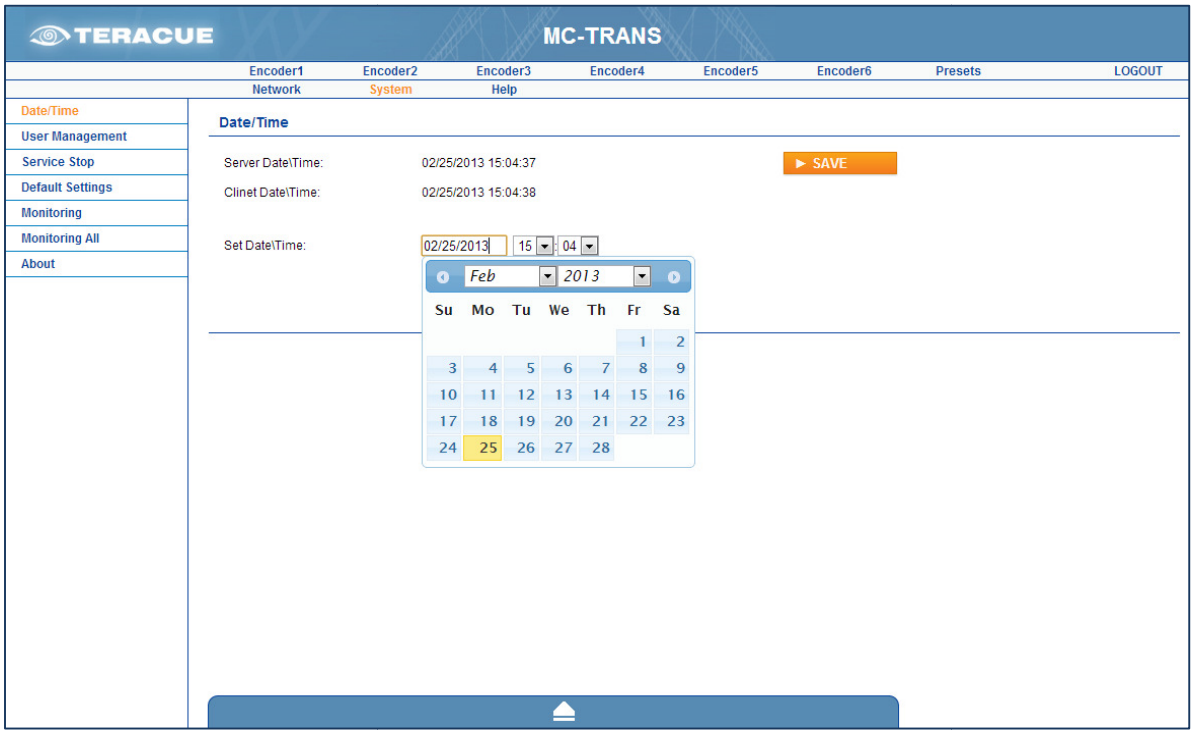

Figure 20: 'System / Date/Time' page of the MC-TRANS

Settings:	Description:
Server Date/Time:	Shows the date / time of the MC-TRANS server. That means the date / time is shown, on which the MC-TRANS is installed. The date syntax is MM/DD/YYYY. The time syntax is hh:mm:ss.
Client Date/Time:	Shows the date / time of the MC-TRANS client. If you have installed a MC-TRANS client on a PC, that means the date / time is shown, on which the MC-TRANS client is installed. The date syntax is MM/DD/YYYY. The time syntax is hh:mm:ss. If you have not installed a MC-TRANS client, the date / time of the MC-TRANS server is shown here.
Time:	Specifies the current date / time. Please enter in the left field the date (MM/DD/YYYY), in the middle field the hour and in the right field the minutes of the current time.

Table 10: Description of the 'System/Date/Time' webpage of the MC-TRANS

3.4.9 Menu: System / User Management

Figure 21 shows the 'System / User Management' page of the MC-TRANS.

If you need to change the password due to security issues, then simply click on the submenu 'User Management', select the user name, which shall be changed, in the 'Select User' drop-down field and enter the new user name and / or the new password in the provided boxes below. Then hit the 'SAVE' button.

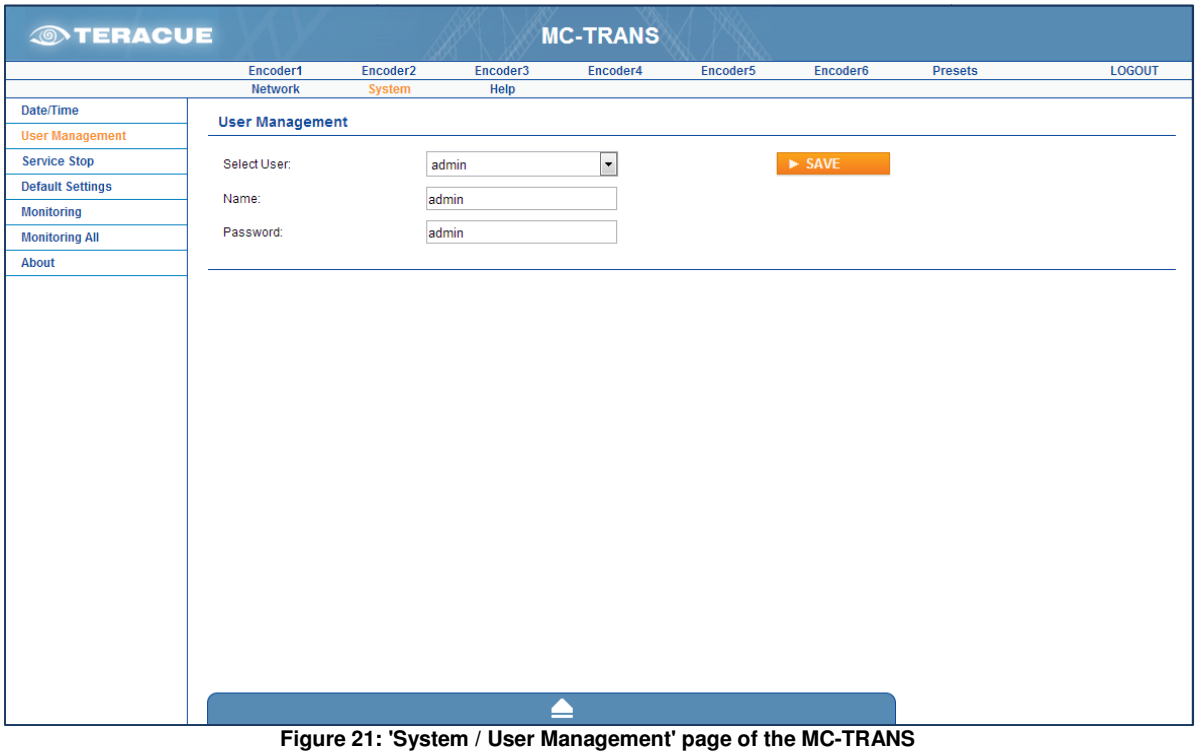

Figure 21: 'System / User Management' page of the MC-TRANS

.!. Unless your MC-TRANS is used in very critical scenarios, we recommend to leave the password set to its default value ('admin', 'admin').

3.4.10 Menu: System / Service Stop

At the 'System / Service Stop' page of the MC-TRANS you can start / stop the MC-TRANS server service. For example this is needed when you want change the network settings of the MC-TRANS or when you want load another MC-TRANS plugin.

To Stop the MC-TRANS server service disable the 'Start/Stop service' check-box and click the 'Apply' button. See Figure 22.

To Start the MC-TRANS server service select in 'Services' drop-down filed your desired MC-TRANS plugin, enable the 'Start/Stop service' check-box and click the 'Apply' button. See Figure 23.

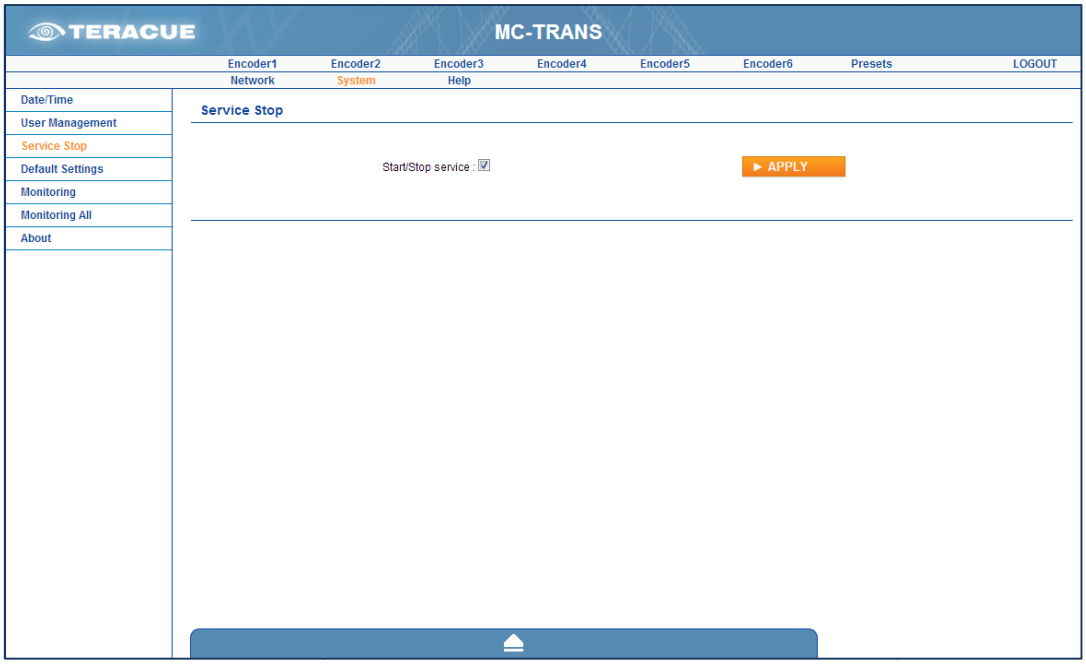

Figure 22: 'System / Service Stop' page with running MC-TRANS server service

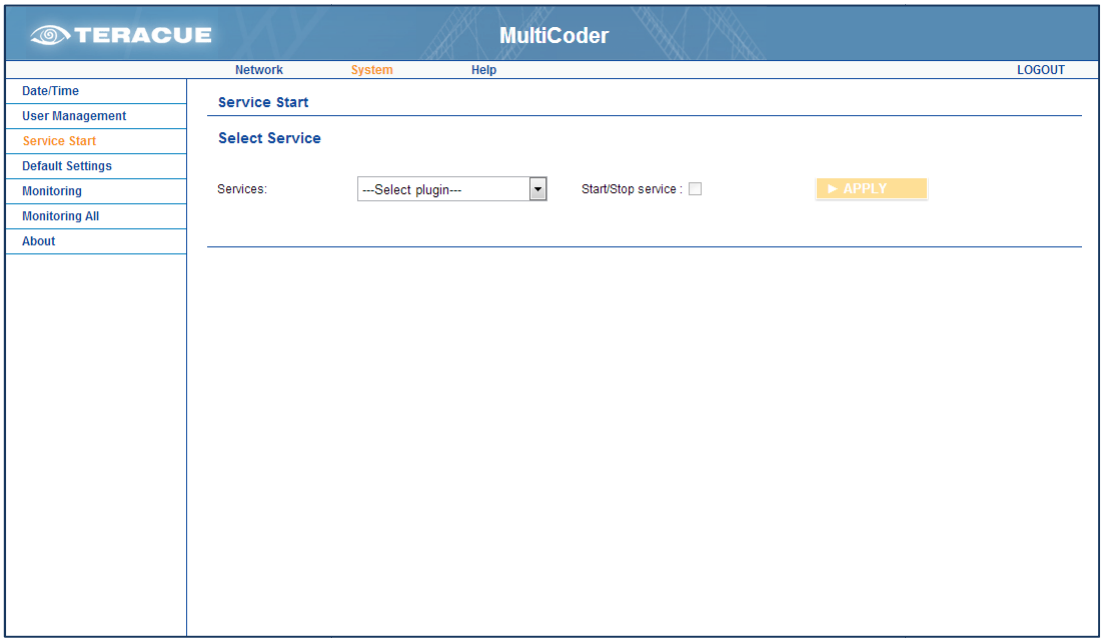

Figure 23: 'System / Service Stop' page with stopped MC-TRANS server service

3.4.11 Menu: System / Default Settings

At the ‘System / Default Settings’ page of the MC-TRANS you can restore the default settings of the application.

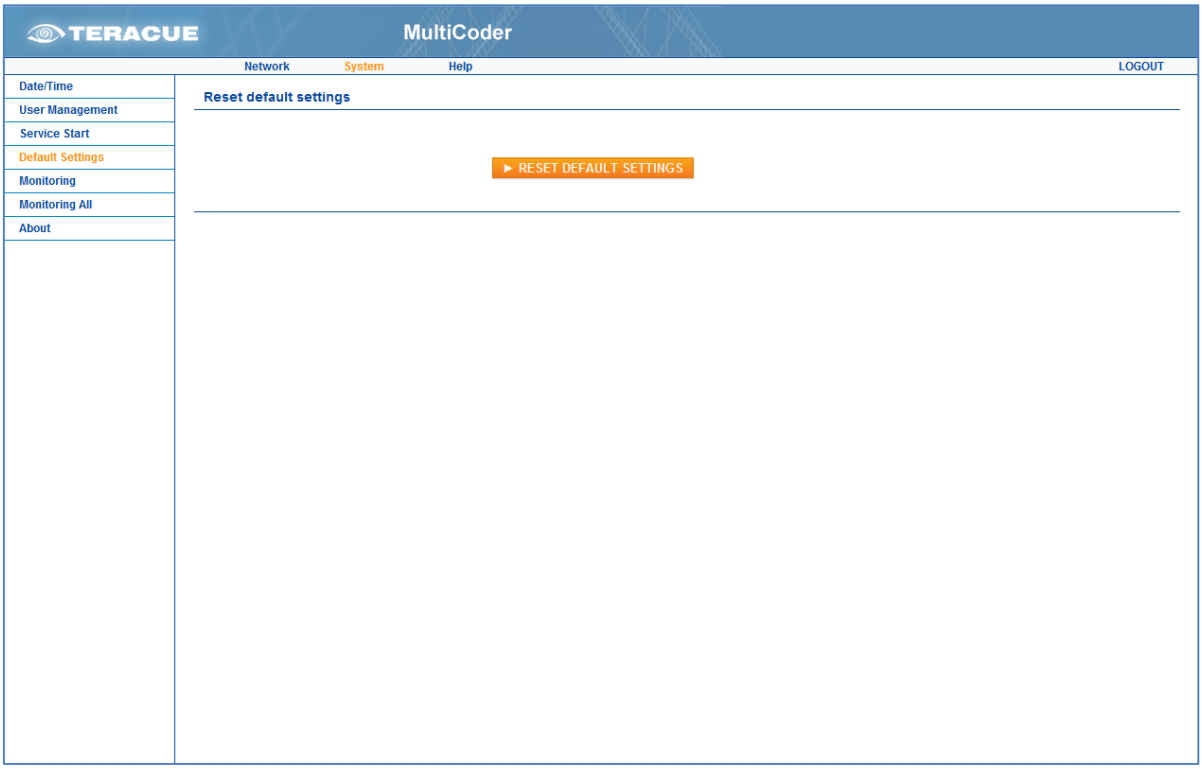

Figure 24: 'System / Default Settings' page of MC-TRANS server

3.4.12 Menu: System / Monitoring

At the ‘System / Monitoring’ page of the MC-TRANS you can get information about your local machine. In this case you can see your MC-TRANS encoders.

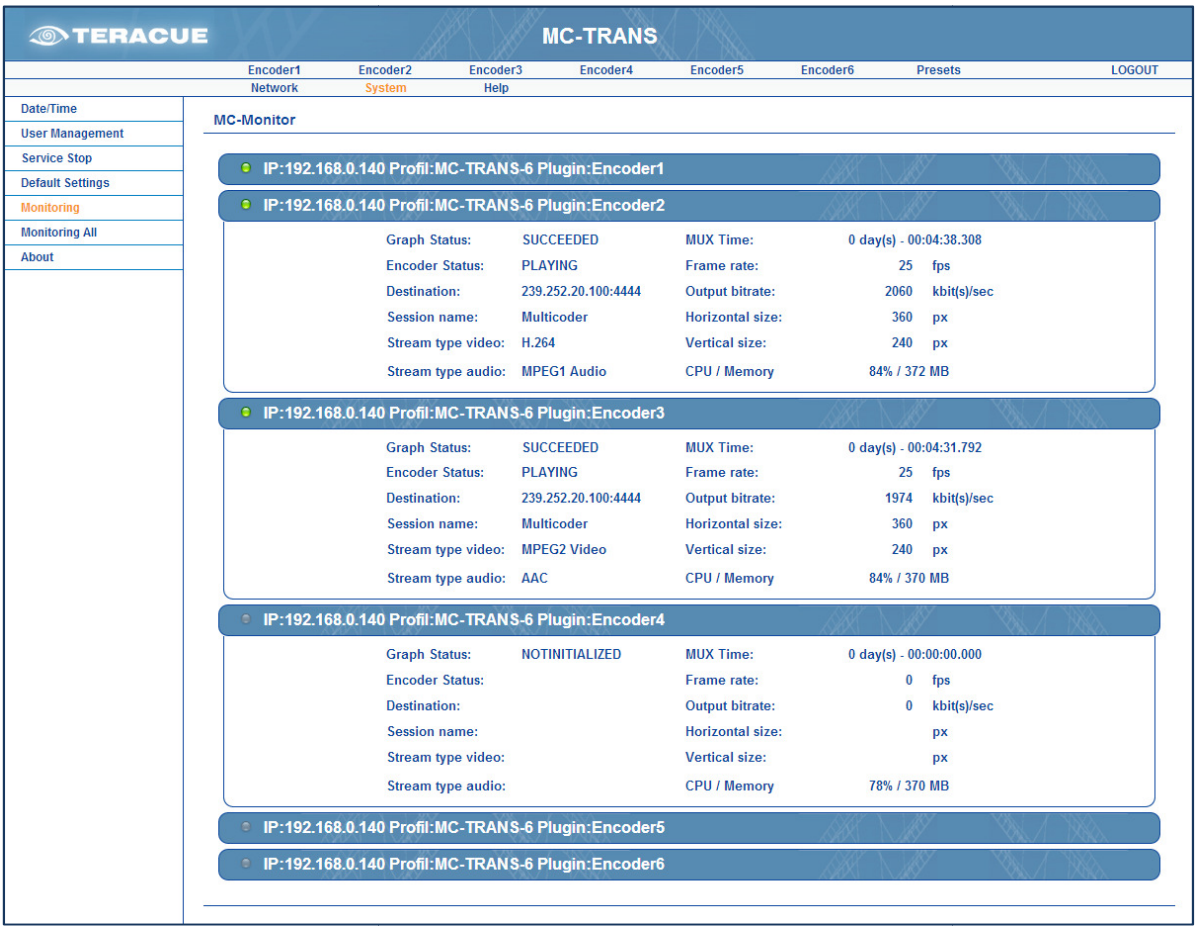

Figure 25: 'System / Monitoring' page of MC-TRANS server

3.4.13 Menu: System / Monitoring All

At the 'System / Monitoring All' page of the MC-TRANS you can get information about the Teracue products in your network. This page lists all encoder streaming information and the connection information of all MC-Route in your network, too.

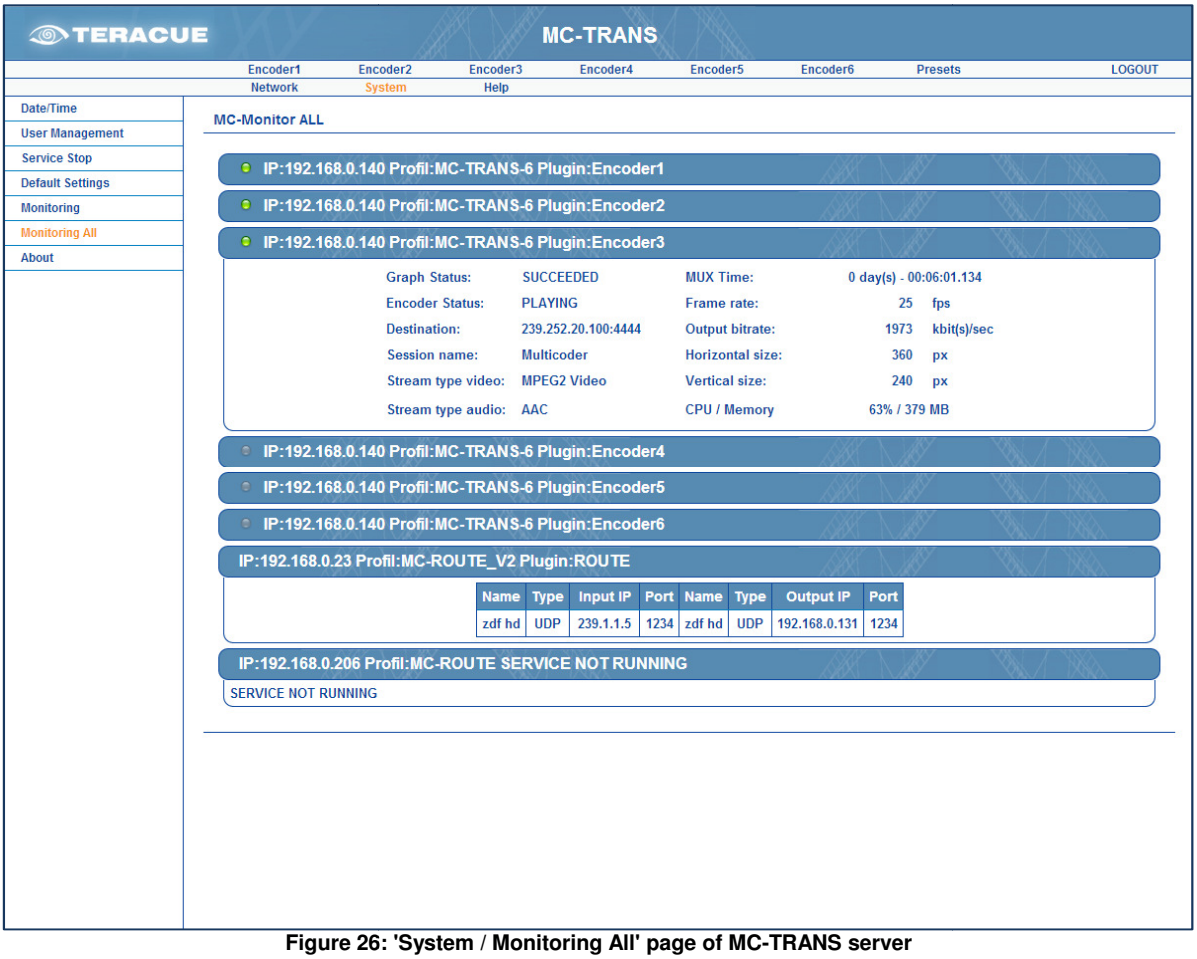

Figure 26: 'System / Monitoring All' page of MC-TRANS server

3.4.14 Menu: System / About

On this page you can check the Mulicoder product name and the version information.

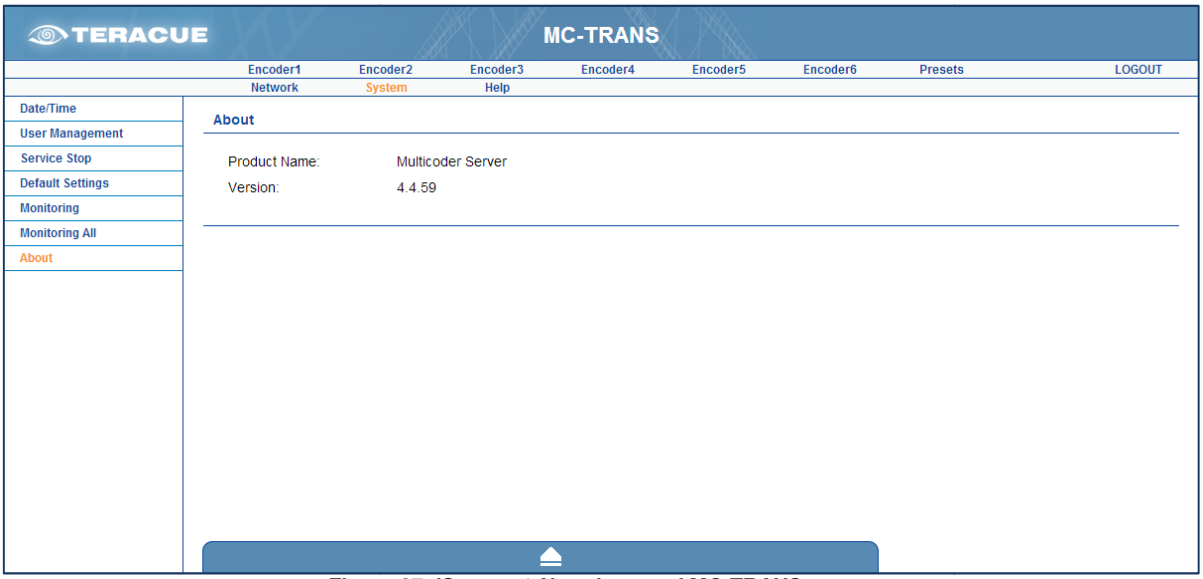

Figure 27: 'System / About' page of MC-TRANS server

3.5 Help

Clicking on the ‘HELP’ button will open the Teracue website where you can get to the ‘Support’ link.

Figure 28: 'Help' page of the MC-TRANS

.!. This will only work if the MC-TRANS is situated in a network in which internet access is provided. Otherwise ‘page not found’ may be displayed.

3.6 Logout

After having made adjustments to the MC-TRANS, please be sure to logout, see Figure 29.

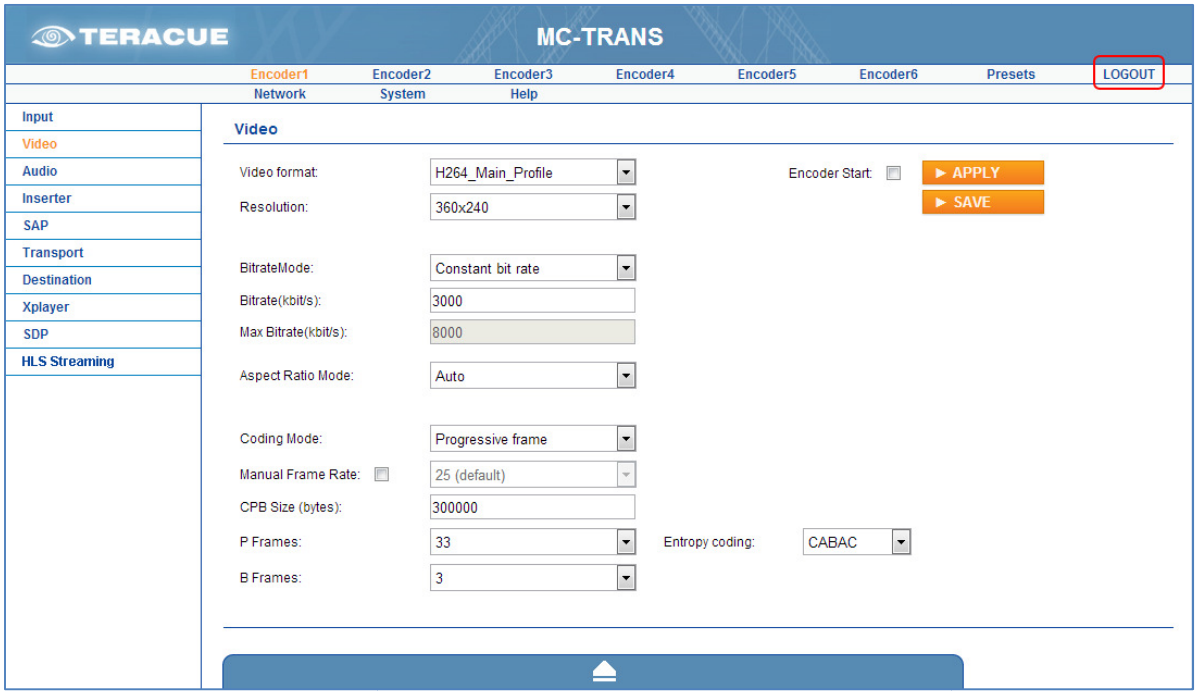

Figure 29: Logout form the MC-TRANS

.!. Logging out prevents misuse and unauthorized access to the MC-TRANS.

3.7 MC-TRANS Webservices

MC-TRANS supports the Webservices. You can get information, MC-TRANS remote with SOAP, HTTP GET and HTTP POST messages.

Visit the following URL to see the list of the available functions.

http://localhost/Multicoder/webservice_mctrans.asmx

There are three categories in the functions:

- Start function
- Stop function
- Get information function

The first three categories have their own ‘ADD’, ‘UPDATE’ and ‘REMOVE’ functions. The last ‘Get information’ category helps you to get information about the current system state and the available variables list which are used in other functions.

- Encoder_Start
- Encoder_Stop
- Get_All_Encoder_Name_List
- Get_All_Encoder_OutputBitrate
- Get_Encoder_Destination_Status
- Get_Encoder_Source_Status
- Get_Encoder_Status
- Get_MulticoderStatusXml
- Get_Service_State
- Service_Start
- Service_Stop
- WebServiceXmlPluginRefresh

4. Video encoding guidelines

When you use the MultiCoder™, we recommend using the supplied presets. Please note: You can freely change all parameters in the advanced settings of the MultiCoder™, but some parameter combinations have possibly no function. To set correct parameters in the advanced settings of the MultiCoder™, you must have a good knowledge about the MPEG-2 and H.264 standard. For example, you use the 'Main Profile' and the 'Main Level' for a MPEG-2 encoding and you want to enter a bitrate of 20 Mbit/s. But the MPEG-2 standard restricts the maximum bitrate of the 'Main Level' to 15 Mbit/s, so you are not able to set the bitrate to 20 Mbit/s. You have set the MPEG-Level to 'Main Level' to do so. The following chapters deliver a small insight of the MPEG-2 and H.264 standard guidelines.

4.1 MPEG-2 video guidelines

MPEG-2 supports different profiles and levels, which can be combined. The following tables shows the profile and level combinations (see Table 11), available picture types and chroma formats of the existing profiles (see Table 12), the maximum bitrates of profiles/levels (see Table 13) and the available framerates (see Table 14):

	Simple Profile	Main Profile	4:2:2 Profile	High Profile
High Level	-	✓	✓	✓
High 1440 Level	-	✓	-	✓
Main Level	✓	✓	✓	✓
Low Level	-	✓	-	-

Table 11: Profile and level combinations of MPEG-2

	Simple Profile	Main Profile	4:2:2 Profile	High Profile
Picture type	I, P	I, P, B	I, P, B	I, P, B
Chroma format	4:2:0	4:2:0	4:2:0 or 4:2:2	4:2:0 or 4:2:2

Table 12: Available picture types and chroma formats of the MPEG-2 profiles

	Simple Profile	Main Profile	4:2:2 Profile	High Profile
High Level	-	80 Mbps	300 Mbps	100 Mbps
High 1440 Level	-	60 Mbps	-	80 Mbps
Main Level	15 Mbps	15 Mbps	50 Mbps	20 Mbps
Low Level	-	4 Mbps	-	-

Table 13: Maximum video bitrates of MPEG-2 profiles/levels

The profiles and levels have also the following abbreviations:

Profiles:
Simple Profile → SP
Main Profile → MP
4:2:2 Profile → 422P
High Profile → HP

Levels:
High Level → HL
High 1440 Level → H144L
Main Level → ML
Low Level → LL

The usage of a specific profile with a specific level will be shown with a @-sign. For example: MP@ML means that you use the 'Main Profile' with the 'Main Level'.

	Resolution W x H	Framerates in fps									
		Progressiv							Interlaced		
		23,97	24	25	29,97	30	50	59,94	60	25	29,97	30
MP@HL	1920x1088	✓	✓	✓	✓	✓				✓	✓	✓
MP@H144L	1280x720	✓	✓	✓	✓	✓	✓	✓	✓			
	1440x1088	✓	✓	✓	✓	✓				✓	✓	✓
MP@ML	704x480; 720x480	✓	✓		✓	✓		✓	✓		✓	✓
	704x576; 720x576		✓	✓			✓			✓		
	640x480	✓	✓		✓	✓		✓	✓		✓	✓
	544x576		✓	✓			✓			✓		
	544x480	✓	✓		✓	✓		✓	✓		✓	✓
	352x576		✓	✓			✓			✓		
	352x480	✓	✓		✓	✓		✓	✓		✓	✓
MP@LL	320x240	✓	✓		✓	✓		✓	✓		✓	✓
	352x240	✓	✓		✓	✓		✓	✓		✓	✓
	352x288		✓	✓			✓			✓		

Table 14: MPEG-2: Available framerates by using the 'Main Profile' with different levels

4.2 H.264 guidelines

H.264 also known as MPEG-4 part 10 supports profiles and levels too. The profiles support different encoding criteria and the levels restrict the encoding parameters. See the Table 15 and the Table 16.

	Baseline Profile	Main Profile	High Profile
I and P Slices	✓	✓	✓
B Slices	-	✓	✓
SI and SP Slices	-	-	-
Multiple Reference Frames	✓	✓	✓
In-Loop Deblocking Filter	✓	✓	✓
CAVLC Entropy Coding	✓	✓	✓
CABAC Entropy Coding	-	✓	✓
Flexible Macroblock Ordering (FMO)	✓	-	-
Arbitrary Slice Ordering (ASO)	✓	-	-
Redundant Slices (RS)	✓	-	-
Data Partitioning	-	-	-
Interlaced Coding (PicAFF, MBAFF)	-	✓	✓
4:2:0 Chroma Format	✓	✓	✓
4:2:2 Chroma Format	-	-	-
4:4:4 Chroma Format	-	-	-
8 Bit Sample Depth	✓	✓	✓
9 and 10 Bit Sample Depth	-	-	-
11 and 12 Bit Sample Depth	-	-	-
8x8 vs. 4x4 Transform Adaptivity	-	-	✓
Quantization Scaling Matrices	-	-	✓
Separate Cb and Cr QP control	-	-	✓
Monochrome Video Format	-	-	✓
Residual Color Transform	-	-	-
Predictive Lossless Coding	-	-	-

Table 15: Supported criteria of H.264 profiles

Table 16 includes the following abbreviations for the word 'macro block' and for the word 'motion vector':

macro block → MB
motion vector → MV

Level	Max MB's/sec	Max Frame size (in MB's)	Max Bit rate for Baseline- and Main Profile	Max Bit rate for High Profile	Typical Frame Resolution	Typical Frame rate in fps	Max Reference Frames	Max MV's per two consecutive MB's
1	1485	99	64 bps	80 kbps	176x144	15	4	-
1.1	3000	396	192 kbps	240 kbps	176x144	30	9	-
					320x240	10	3	
					352x288	7,5	3	
1.2	6000	396	384 kbps	480 kbps	352x288	15	6	-
1.3	11880	396	768 kbps	960 kbps	352x288	30	6	-
2	11880	396	2 Mbps	2,5 Mbps	352x288	30	6	-
2.1	19800	792	4 Mbps	5 Mbps	352x480	30	6	-
					352x576	25		
2.2	20250	1620	4 Mbps	5 Mbps	720x480	15	5	-
					720x576	12,5		
3	40500	1620	10 Mbps	12,5 Mbps	720x480	30	5	32
					720x576	25		
3.1	108000	3600	14 Mbps	17,5 Mbps	1280x720	30	5	16
3.2	216000	5120	20 Mbps	25 Mbps	1280x720	60	4	16
4	245760	8192	20 Mbps	25 Mbps	1920x1088	30	4	16
					1280x720	60		
4.1	245760	8192	50 Mbps	62,5 Mbps	1920x1088	30	4	16
					1280x720	60		
4.2	491520	8192	50 Mbps	62,5 Mbps	1920x1088	60	4	16
5	589824	22080	135 Mbps	168,75 Mbps	2048x1024	72	5	16
5.1	983040	36864	240 Mbps	300 Mbps	2048x1024	120	5	16
					4096x2048	30		

Table 16: Restrictions of H.264 levels

5. Audio encoding guidelines

5.1 MPEG-1 and MPEG-2 audio guidelines

MPEG-Version:		Sample rates in kHz:					
		16	22,05	24	32	44,1	48
MPEG-1	Layer I	-	-	-	32 – 448 kBit/s	32 – 448 kBit/s	32 – 448 kBit/s
	Layer II	-	-	-	32 – 384 kBit/s	32 – 384 kBit/s	32 – 384 kBit/s
	Layer III	-	-	-	32 – 320 kBit/s	32 – 320 kBit/s	32 – 320 kBit/s
MPEG-2	Layer I	32 – 256 kBit/s	32 – 256 kBit/s	32 – 256 kBit/s	-	-	-
	Layer II	8 – 160 kBit/s	8 – 160 kBit/s	8 – 160 kBit/s	-	-	-
	Layer III	8 – 160 kBit/s	8 – 160 kBit/s	8 – 160 kBit/s	-	-	-

Table 17: Available audio bitrates and sample rates of MPEG-1 and MPEG-2 audio

6. Restriction of Hazardous Substances Directive (RoHS)

The MC-TRANS™ is manufactured according to the RoHS Directive. The Directive on the Restriction of Hazardous Substances in Electrical and Electronic Equipment (RoHS) has been passed as a law by the European Union. It affects manufacturers, sellers, distributors and recyclers of electrical and electronic equipment containing hazardous substances as lead, cadmium, mercury, hexavalent chrome, polybrominated biphenyl (PBB) and polybrominated diphenyl ether (PBDE).

After July 1, 2006 the use of these materials will be banned in new products sold in Europe.
Since beginning of 2005, Teracue AG began the process of redesigning and converting all of its products to not contain any of the listed materials. All new products sold by Teracue will be fully RoHS-compliant by July 1, 2006.

7. Waste Electrical and Electronic Equipment Directive (WEEE)

The WEEE Directive has been passed to reduce waste arising from electrical and electronic equipment. It encourages reuse, recycling and other forms of recovery. Customers and end-users of electronic equipment in the EU can therefore play an important role in reducing WEEE and saving the environment by separating out WEEE and disposing of it properly.

Teracue AG is a registered WEEE participant since 2004. Within Germany, Teracue is registered under the WEEE Number: DE10642708. German customers and end-users are required to discard products marked with the WEEE symbol (crossed out trash bin) at local resource collection points. Do not dispose products marked with the WEEE symbol in domestic refuse.

Every country within the EU has defined different directives and methods for the collection of electronic materials to ensure the WEEE Directive. Please follow the national guidelines that have been identified for your country. For more information about waste disposal of your old electrical and electronic equipment, please contact your local city office, your waste disposal service or the company where you bought the product.

III. List of figures

FIGURE 1: LCD-DISPLAY AND THE 5 CONFIGURATION BUTTONS OF THE MC-TRANS™ APPLIANCE 7
FIGURE 2: CONFIGURATION BUTTONS WITH ASSIGNED FUNCTION NAMES 7
FIGURE 3: MC-TRANS™ APPLIANCE REAR SIDE 8
FIGURE 4: MC-TRANS WEB INTERFACE 'LOGIN PAGE' 9
FIGURE 5: SETTINGS OF THE MC-TRANS 10
FIGURE 6: BLUE INFO-BOX OF THE MC-TRANS WEBPAGES 11
FIGURE 7: 'ENCODER / INPUT' PAGE OF THE MC-TRANS 12
FIGURE 8: 'ENCODER / VIDEO' PAGE OF THE MC-TRANS 14
FIGURE 9: 'ENCODER / AUDIO' PAGE OF THE MC-TRANS 16
FIGURE 10: 'ENCODER / INSERTER' PAGE OF THE MC-TRANS 17
FIGURE 11: 'ENCODER / SAP' PAGE OF THE MC-TRANS 18
FIGURE 12: 'ENCODER / TRANSPORT' PAGE OF THE MC-TRANS 19
FIGURE 13: 'ENCODER / DESTINATION' PAGE OF THE MC-TRANS 20
FIGURE 14: 'ENCODER / XPLAYER' PAGE WITH OPENED XPLAYER 22
FIGURE 15: 'ENCODER / HLS STREAMING' PAGE WITH THE M3U8 LINK 24
FIGURE 16: 'PRESETS / MANAGEMENT' PAGE OF MC-TRANS 25
FIGURE 17: 'PRESETS / SAVE' PAGE OF THE MC- TRANS 26
FIGURE 18: 'PRESETS / LOAD' PAGE OF THE MC-TRANS 27
FIGURE 19: 'NETWORK / SETTINGS' PAGE OF THE MC-TRANS 28
FIGURE 20: 'SYSTEM / DATE/TIME' PAGE OF THE MC-TRANS 29
FIGURE 21: 'SYSTEM / USER MANAGEMENT' PAGE OF THE MC-TRANS 30
FIGURE 22: 'SYSTEM / SERVICE STOP' PAGE WITH RUNNING MC-TRANS SERVER SERVICE 31
FIGURE 23: 'SYSTEM / SERVICE STOP' PAGE WITH STOPPED MC-TRANS SERVER SERVICE 31
FIGURE 24: 'SYSTEM / DEFAULT SETTINGS' PAGE OF MC-TRANS SERVER 32
FIGURE 25: 'SYSTEM / MONITORING' PAGE OF MC-TRANS SERVER 33
FIGURE 26: 'SYSTEM / MONITORING ALL' PAGE OF MC-TRANS SERVER 34
FIGURE 27: 'SYSTEM / ABOUT' PAGE OF MC-TRANS SERVER 35
FIGURE 28: 'HELP' PAGE OF THE MC-TRANS 36
FIGURE 29: LOGOUT FORM THE MC-TRANS 37

IV. List of tables

TABLE 1: DESCRIPTION OF THE BLUE INFO-BOX OF MC-TRANS WEBPAGES 11
TABLE 2: DESCRIPTION OF THE 'ENCODER/INPUT' WEBPAGE OF MC-TRANS 13
TABLE 3: DESCRIPTION OF THE 'ENCODER/VIDEO' WEBPAGE OF THE MC-TRANS 15
TABLE 4: DESCRIPTION OF THE 'ENCODER/AUDIO' WEBPAGE OF THE MC-TRANS 16
TABLE 5: DESCRIPTION OF THE 'ENCODER/INSERTER' WEBPAGE OF THE MC-TRANS 17
TABLE 6: DESCRIPTION OF THE 'ENCODER/SAP' WEBPAGE OF THE MC-TRANS 18
TABLE 7: DESCRIPTION OF THE 'ENCODER/TRANSPORT' WEBPAGE OF THE MC-TRANS 19
TABLE 8: DESCRIPTION OF THE 'ENCODER/DESTINATION' WEBPAGE OF THE MC-TRANS 21
TABLE 9: DESCRIPTION OF THE 'NETWORK/SETTINGS' WEBPAGE OF THE MC-TRANS 28
TABLE 10: DESCRIPTION OF THE 'SYSTEM/DATE/TIME' WEBPAGE OF THE MC-TRANS 29
TABLE 11: PROFILE AND LEVEL COMBINATIONS OF MPEG-2 39
TABLE 12: AVAILABLE PICTURE TYPES AND CHROMA FORMATS OF THE MPEG-2 PROFILES 39
TABLE 13: MAXIMUM VIDEO BITRATES OF MPEG-2 PROFILES/LEVELS 39
TABLE 14: MPEG-2: AVAILABLE FRAMERATES BY USING THE 'MAIN PROFILE' WITH DIFFERENT LEVELS 40
TABLE 15: SUPPORTED CRITERIA OF H.264 PROFILES 40
TABLE 16: RESTRICTIONS OF H.264 LEVELS 41
TABLE 17: AVAILABLE AUDIO BITRATES AND SAMPLE RATES OF MPEG-1 AND MPEG-2 AUDIO 42